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

London, January 8, 1892.

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

OXYGEN CYLINDERS AND GAUGES.

To the EDITOR.

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

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

Manchester Oxygen Company, Limited, Manchester.

To the EDITOR.

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

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

CHARLES E. GLADSTONE, *Hon. Sec.*

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

THE PHOTOGRAPHIC SOCIETY.

To the EDITOR.

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

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

27, *Hanley-road, Hornsey Rise, N.*

AN EFFICIENT HAND CAMERA.

To the EDITOR.

SIR,—In your "Answers to Correspondents" in THE BRITISH JOURNAL OF PHOTOGRAPHY, December 11, 1891 (to which my attention has been directed by a friend, and which I had overlooked, otherwise I should have replied before this), I find an article of mine is called in question that was inserted in THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC for the present year.

Although I have had no intention of patenting the camera or protecting it in any way, I cannot see how I can have copied Mr. Miller's camera, when my first and only knowledge of its existence is shortly described in THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC for the present year, although I have searched in volumes and ALMANACS for 1890 and 1891 without finding any mention of it. In sending the short description given in the ALMANAC for the present year, Mr. Miller claims that his camera is free from springs and pushes; mine has both. Will Mr. Miller kindly state wherein my apparatus is like his invention?—I am, yours, &c.,

Southampton, January 6, 1892. GEO. W. VALENTINE.

FRENCH PATENTS.

To the EDITOR.

SIR,—Your very interesting last number duly to hand. Allow me, please, to make a slight suggestion *re* your "French Patents," page 21. You say England has taken more patents than France. There is always two sides to a question, and the other side is, Which are the most *valuable*, and the most *in actual use?* It is easy to take out a patent, but to sell the article is another thing. Then, again, maybe the Frenchman is more liberal; if he invents something good, he may be apt to give the benefit to the general public. This may be worth your while looking into when you put *la Perfide Albion* against *la Belle France* in comparison as to patents and their *actual value*. Not long ago you found yourself patents taken out too lavishly for trinkets never used.—I am, yours, &c.,

Asnières, January 9, 1892. ALBERT LEVY.

Exchange Column.

Large showcase, 72×15×48 inches, velvet lined, good condition; exchange, violin or studio accessories.—Address, W. J. HARE, Windsor Studio, Sutton, Surrey.

Exchange good half-plate French portrait lens, with separate lens tube for landscape work, stops, &c., complete, for half or whole-plate studio camera or posing chair.—Address, R., 55, Wellington-street, Millom, Cumberland.

Wanted, a whole-plate camera and lens, or extra good whole-plate camera or lens, in exchange for Coventry Safety bicycle, perfectly sound in every part, and in good condition.—Address, ARTHUR E. PEAILL, 3, Park-road, Hampstead.

Will exchange two long-distance magnetos for telephones, in perfect order, polished cases, switch arrangement, lightning arrester, &c., complete, silver-plated fittings; wanted, 10×8 or 12×10 camera or posing chair.—Address, E. WAITE, 10, Grundy-street, Radcliffe, Manchester.

Wanted, half-plate rapid rectilinear and whole-plate wide-angle rectilinear, by good maker; exchange, large developing sink, Stanley's magnesium enlarging lamp, Grubb's 12×10 landscape lens, Burton's cabinet-portrait lens, whole-plate and C.-D.-V. French portrait lenses, whole-plate camera.—Address, E. PENFOLD, 116, Parade, Leamington.

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the base $\frac{1}{r}$, or, multiplied by the proper modulus, to any other base.* The ratios of the logarithms of transparencies are thus shown to correspond to the number of superposed films, each of which contains the same quantity of reduced silver; and it follows, therefore, that they are proportional to the amount of silver per unit area; but the *total thickness* of film in this case *varies*, and in the same proportion as the different values of n. It has not been proved that the same law applies when, as in a photographic plate, the thickness of film is always the same, and the silver, whether much or little, always contained in the same space. Messrs. Hurter & Driffield merely write: "The reduction of the intensity is, of course, due to the black particles, and depends simply upon the number of them which are interposed per unit of area." But that does not appear to be so entirely a matter of course as is here implied; the positions of the particles of silver may have to be taken into consideration. Carried to the absurd, we should expect to find, on these principles, that a sheet of perforated zinc transmitted no more light than a thinner unbroken piece of the same metal, if of equal size and the same weight, as the number of molecules of zinc per unit of area of each piece would be identical. Messrs. Hurter & Driffield's principles will, no doubt, be found correct when the thickness of film is large compared with the size of the grains of silver; but it must be remembered that, in most rapid plates, the grains are of appreciable size. If we take an extreme case, and suppose a film of only the same thickness as the diameter of one grain, it is evident that there could then be no overlapping, so that every grain would obstruct the same amount of light, and the opacity (using the expression, however, in a different sense to that adopted by Messrs. Hurter & Driffield) would be proportional to the quantity of silver present. The transparency to one unit of light would be $1-a$, a representing the amount of light obstructed, and being always proportional to the amount of silver.

Mr. Plener, in one of an unfinished series of articles on subjects of this nature (rather marred by confusion of arithmetical and geometrical progressions) in the *Photographic News* of 1882, when considering the principles involved in the preparation of sensitometer screens, gave a formula based on the above which, with some modification, may be applied to the case of photographic plates. Simplifying his method a little, the film may be considered as consisting of n imaginary layers, each of the thickness of one of the grains of silver, and each passing $1-a$ of the light received. The transparency of the actual film will then be a fraction equal to $(1=a)^n$ (this is supposing the grains to be all of equal size and evenly distributed), a varying in the same proportion as the total amount of silver present. Messrs. Hurter & Driffield's principles might be represented by the same formula, treating n as the variable quantity. In either case n would represant the thickness of film; but if we take a transparency of $(1-a)^n$ as a standard, the effect of doubling the amount of silver, for example, would by one system give $(1-2a)^n$, and by the other $(1-a)^{2n}$. Now, when n is very large, the values of these two formula will be practically identical, and, remembering that $n=\frac{\text{thickness of film}}{\text{diameter of grain}}$, it appears to have been large in all the experiments by which Messrs. Hurter & Driffield tested the corrected of their views. For the experiment with Indian ink, a cell was employed, the width of which was probably many times greater than the thickness of a dry gelatine film; and in all their more important experimental work they used Chapman's *slow* plates, in which the silver would no doubt be in a very finely divided state, and these plates were specially prepared, "every care being taken to secure a *thick* and even film." Captain Abney, in 1889, performed some experiments in this direction, and I find his results in a trial with Indian ink in no way support Messrs. Hurter & Driffield's views; while an experiment with dried gelatine films containing known quantities of silver certainly agrees fairly well with them in the middle numbers, but is quite out at both ends of the series.

Dr. Eder gives ·003 mm. as the diameter of the grains of Ag Br in rapid emulsion, and the average thickness of film in a gelatine plate may, perhaps, be taken as about ·03 mm. These are not extreme figures, and many instantaneous plates probably have coarser grains contained in much thinner films; but, if we use these estimates, we have a ratio of 1:10, so that $n=10$ and that value of n will lead to very different results if the formula derived from Mr. Plener's article be followed to those which would be shown by that of Messrs. Hurter & Driffield. If we start with such a proportion of silver that one-tenth the thickness of film would obstruct ·01 of the light, then the total transparency would be $·99^{10}$—·9044; and, taking that as representing the effect of one unit of silver by either formula, the accompanying table will show the results of increasing the amount:—

Amount of Silver.	Transparencies.	
	Plener.	Hurter & Driffield.
1	·9044	·9044
10	·3487	·3660
20	·1074	·1340
40	·0061	·0179
50	·00098	·00658

It will be seen that increasing the silver ten times—which gives a transparency of about $\frac{1}{3}$—has produced but little difference between the columns, but they then gradually disagree, till in the great densities given by fifty times the silver, if the first column is correct, the other shows more than six times too great transparency. Eighty units of silver would show a difference of three thousand times, but the densities would then be far beyond anything we have to consider in photography.

The formula I have described appears to be more probably correct than that of Messrs. Hurter & Driffield, but still there are several reasons why it is not altogether to be depended on. I have treated the grains of silver as being all of the same size and equally distributed through the film, but these conditions are, of course, not really fulfilled. In all emulsions the fineness of grain varies considerably (the more the better), and finely divided matter gives much greater opacity than an equal quantity in a coarser state. Then the bromide of silver always settles down more or less in coating the plate, especially in the case of rapid emulsions. The coarser and more sensitive grains sink to the bottom, while the finer, remaining on the surface, will be the first attacked both by light and by the developer. The thickness of the film, too, varies after development, the more transparent parts being depressed. All these matters lead to much uncertainty in any attempt to find a formula which may be depended on. So far as they result in greater concentration of the deposit, the result would be similar to taking a smaller value for n, but the whole is so doubtful that there seems little hope of finding a really correct formula by which the amount of silver may be calculated from the transparency, or *vice versâ*, especially in rapid plates. Experiments may perhaps lead to the discovery of a satisfactory empirical formula, and, in fact, that of Captain Abney agrees very closely with observed results except in the higher densities.

Messrs. Hurter & Driffield's method is, no doubt, practically right in regard to very slow plates, and their "correct formula," which depends upon the truth of it, is, at any rate, in that case probably quite trustworthy. Even if its application must be limited to the case of slow plates, this "correct formula" may be of much value in future investigations, and probably in many scientific uses of photography.—I am, yours, &c.,

H. J. Channon.

Woodlands, Lewisham, S.E., March 7, 1892.

* *Opacity*, as defined by Messrs. Hurter & Driffield, is merely the reciprocal of *transparency*, and represented by changing the signs of the logarithms, which would otherwise be negatived by the ordinary tables.

SOCIETY FOR KENSINGTON AND BAYSWATER.

To the Editor.

Sir,—Owing to the West London Photographic Society having moved its headquarters from Hammersmith to Chiswick, the large district comprising Bayswater, Hammersmith, Kensington, and Notting Hill is now left without a society. Within this large area it is thought there are many photographers, both amateur and professional, who would benefit by a society being formed in their midst, so a few gentlemen interested in the subject met last week, and resolved to call a meeting for that purpose. It will be held at the Horbury Rooms, Kensington Park-road (close to Notting Hill-gate station, on the Metropolitan Railway), on Monday, the 21st inst., at 8.30 p.m., and all gentlemen interested in the matter are invited to attend. Those unable to attend, but willing to join in the movement, are requested to send in their names to me before the date of the meeting.—I am, yours, &c.,

Charles W. Brumwell,
Secretary pro tem.

7, *Lower-terrace, Notting Hill, W.*

LOSS OF DENSITY IN FIXING.

To the Editor.

Sir,—Please allow me a few words more on "loss of density in fixing." You say at the end of your notice, p. 130, that the so-called loss of density in the fixing bath is due to under-development or under-exposure. Exactly what I said—under-development principally, however. Now, ask the manufacturers to say on labels that their plates should be developed rather more or less than others, or something to that effect, and all will be right.

When I said it would be better for the professional or amateur wanting to make a trial of the plates, and in the end to the manufacturer, I meant to prevent the discouragement to the amateur and if you want the renewal of a trial to the professional. The first one may give that brand of plates up at once, as not sensitive enough; and the second one (professional), if more conscientious, may try more exposures and increased density in development, or may give up without further trials.

I may be mistaken in the origin of the reason why, but here is one of my experiences, repeated several times. I took a negative with rapid exposure, and developed it fully, and even more than I usually do, judging by transparency and by the back of negative; and, after fixing, the negative was not fit to print from, being too thin.

Allow me to tell you my way of judging when a negative is fully developed, and perhaps you will see that the iodide of silver or the thickness of the film play a lesser part in the judgment, at least with me, as to when I should stop the development or go further, than you may think. When I put the plate in the developer I watch the image, first as it comes on the face of the plate, and then by transparency, until it gets the intensity it should have when finished; then I watch it from the back by the colour it gets (not the image, which I cannot see by reflected light, of course). From first white it turns slightly grey, and, as this colour

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deepens, I consider the negative well done when this grey is pretty dark; say, about the colour of bright old silver. Then I stop, and wash and fix, and the result is, about ninety-nine times out of a hundred, good.

This for my regular brand of plates, W. & W.'s. Some other plates may work the same, but certainly some do not; and, to get a good printing negative, I have to watch the back, on some of those, get to a much darker grey, edging on black; and, as to transparency, not be able to know what is on the plate. However, result: a very good negative to print from.

Loss in hypo, or what? Development has certainly to be carried on further than with other plates. If the manufacturer can let us know about it beforehand, some trouble can be saved, and probably some more trade to some of them.—I am, yours, &c., A. LEVY.

4, *Avenue Pinel, Asnières* (*Seine*), *February* 29, 1892.

MR. COLES AND MR. HOWSON.

To the EDITOR.

SIR,—As Mr. Howson refrained last week from mentioning any evidence in support of the accusation made against me of misrepresenting him, I can only assume none to be forthcoming and the charge to be considered as withdrawn.—I am, yours, &c., WILLIAM COLES.

Watford, March 7, 1892.

THE TRUE POSITION OF THE PHOTOGRAPHER IN THE ART WORLD.

To the EDITOR.

SIR,—I see that my letter of January 8 did not altogether convey the impression to the minds of some of your readers that I expected or intended, and, if I might be allowed to further introduce myself, no doubt they will become better acquainted with me. My connexion and association with photography, extending over a period of nearly twenty years, entitles me, perhaps, to as much recognition in your columns as the majority of your readers; nevertheless, my experience as an artist constitutes me a decided outsider, as far as some of the sentiments expressed therein are concerned.

Perhaps it is due to my training as an artist that I have been led in my own mind to make so pronounced a distinction between the word Artist and the word Photographer that I took it for granted the two would not in any way become confounded. In this I am perhaps to blame, as it is now evident that a wide and varied construction is put on the word Artist among your readers. In justice to that portion of your readers I represent, I feel bound to give my own definition of it. I must admit I find some difficulty in approaching this subject without leaving myself open to misconstruction and giving offence where least intended, and, did I not feel confident that I should meet with the support of higher intelligence among your readers than my own, I should not feel competent to come forward.

Before going further, I might point out that my letter was in the main a protest against a one-sided controversy, in which the artist was not up to then represented, and only appeared to be recognised as an opposing party, and that I made little or no attempt at argument under the heading you kindly supplied; and, while claiming to be recognised as a supporter of the interests of science and art, I most respectfully decline to participate in any contention that appears to me unworthy of the name.

Vague as the word Artist may appear to be to some, I have always regarded it as belonging to that school whose course of training is laid down on the same lines as those adopted by the so-called artist-painter, whatever branch may be ultimately intended; whether it be sculpture, painting, engraving, designing, &c., it must necessarily be of a creative nature.

An artist may take up photography and become an artist in photography (in connexion with it), but cannot obtain that position without first proving himself an artist outside of it, and altogether independent of it, for the simple reason, and it is an admitted fact, that by resorting to mechanical means he is digressing from the principles upon which he became an artist; hence all the more reason for efficiency beforehand, and under which circumstances he must revert as often as possible to the training he commenced with to keep him up to his standard merit and prevent retrogression. It cannot be denied there is good scope for the exercise of artistic intelligence in connexion with photography; nevertheless, its advantages must be realised to be properly appreciated. I cannot admit of any person becoming an artist on his own assumption—there must be some tangible proof of qualification; otherwise, where indeed must the line be drawn? I maintain that the trained artist is the fit and proper person to carry out the work of the scientist in photography, and so supply what the intelligent patron will demand, the combination of science and art.

The scientist does not claim perfection in photography from an artistic point of view, nor does the artist take credit to himself for the scientific part—only for what he is able to supply. We all take up photography more or less on sufferance, and we have no right to abuse our privileges. What I strongly condemn and refuse to participate in are the insults that are piled upon the artist who prefers to dispense with all mechanical means in bringing about his desired result.

What must our esteemed brother artists in other capacities think of the intelligence or sincerity of a man claiming to be an artist, who will compare the mere brushes and palette of an artist with the camera and lens of a photographer, and place them on an equality as regards the part they play in the production of the work? I would ask such, are they under the impression that brushes can be bought guaranteed to paint, or form pictures of given dimensions, the same as they can buy lenses, and do they suppose that brushes and palette can be so set together that an artist can go away and leave them doing the work, come back and apply a liquid to his canvas, and find the picture complete, and not always be sure, unless he has correctly numbered his canvas, what the subject of his picture was going to be, or which was the right end up?

To designate a man 'a wielder of the brush' is to imply that he uses the brush mechanically, as he might do in painting a house, &c. The use of the brush does not make a man an artist any more than the use of the camera and lens will ever make a photographer one. If there is nothing in a name, why are photographers so anxious to prove their claim to the title of artist, and why take trouble to analyse the word, and show that it means nothing in particular? Or why investigate ancient history to show that artists were thought nothing of before the world was barely civilised or educated? And is it not as mean as it is ridiculous to compare a photograph with a water-colour drawing? If the photograph was the best specimen ever produced, and the water-colour drawing the worst, the one is still a mechanical production, and the other a work of art. The photographer will take credit where he is not entitled to it, or where his intelligence is not in any way responsible; the actual creation of the desired object is the work of nature.

A photograph may be compared to a plant; the dry plates are like the virgin soil, the ground has been prepared, the exposure is given, the seed is set, the latent image is there, it is watered, it is nourished, the developer is applied; now notice how the cold weather retards its growth, notice how the sunshine accelerates its development, soon a plant in full bloom appears on the surface.

But suppose you have a friend who has made, by his own hand, a beautiful imitation in wax of the same kind of plant, and he shows it to you, would you have the impertinence to tell him you had made one "that would beat that into a cocked hat," and rush off and fetch the one you had grown in your garden? Does this illustration not give you some notion of the meaning of the word Art?

If the photographer cannot claim to have contributed something towards the advancement of the science of photography, beyond amusing himself with it, or living on it as though it were specially designed for his benefit, and if he refuses to qualify himself as an artist, then he is nothing more than a mechanical photographic practitioner; and, if I am asked the question, I should say, these are the men who have benefited most by photography, and hang on to the name of science and art for protection, while they insult people who have earned a superior position.—I am, yours, &c.,

ARTIST WITH BRUSH, PENCIL, AND CAMERA.

45 *Wynford Street, Eccles New Road, Manchester.*

Exchange Column.

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

Wanted, 7½×5 or larger camera complete. Exchange *Gazetteer of the* World (Fullarton's), thirty-two parts, complete, uncut. Address, ROBERT MCCONCHIE, Kirkcudbright.

Pair of backgrounds in flatted oils, on linen, 8 ft.×7 ft. 6 in. Exchange for good violin. Photographs forwarded. Address, W. HARE, Windsor Studio, Sutton, Surrey.

Will exchange three-quarter-plate rapid portrait lens by Spicer Brothers for half-plate rapid rectilinear or Euryscope lens by a good maker.—Address, P. PILCHER, Photographer, Dover.

I will exchange Cassell's *Technical Educator*, clean and perfect, for half-plate combination rectigraph lens, or Booth's mitre-cutting machine. Address, M., 3, Nightingale-terrace, Sutton, Surrey.

Forty-one numbers of the *Photographer's World*, commencing with No. 4, for the *Ilford Manual* and Robinson's *Picture Making by Photography*.—Address, H. O. THOMPSON, 45, Gloucester-road, Newcastle-on-Tyne.

Seven years' BRITISH JOURNAL OF PHOTOGRAPHY, Ross's 10 × 8 doublet, ditto whole-plate doublet, backgrounds, Seavey's, rustic bridge, half-plate portrait lens, strong tripod stand; wanted, 12 × 10 landscape camera, with double slides, also changing-back chair.—Address, W. BASSETT, Stoke-road, Guildford.

Will exchange a very light half-plate camera, three double slides, rapid rectilinear lens, Thornton-Pickard shutter, stand, whole weighing under nine pounds, nearly new, cost 8l. 15s.; also a quarter-plate Lancaster's International, three double metal slides, lens, shutter, stand, and case, complete, cost altogether 3l. 15s., with an extra double slide and screen, for a Ross's Cabinet portrait lens.—Address, MATIN, The Avenue, St. Margaret's, Twickenham.

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images which are not alike do not correspond in the same way; they would if the object was flat, and by experience and association with other mental faculties we know them to be solid. When we look at a near object, the convergence of the optic axis is greater than when a more distant object is observed, and the dissimilarity of the indistinct images is more prononnced.—I am, yours, &c., W. I. CHADWICK.

Manchester, April 6, 1892.

RATIO OF GRADATION.

To the EDITOR.

SIR,—In your issue of the 25th inst., "Free Lance" asks me a question which I have already answered in the previous number of the JOURNAL. I will, however, answer it once more. The experiments of Messrs. Hurter & Driffield show that the gradations of a negative are "almost identically the same whatever developer be employed." But "there is a theoretical possibility that a plate may be rapid to one developer and slow to another."

It is therefore true that beyond a trifling limit the photographer has (according to Messrs. Hurter & Driffield) no means at his disposal for altering the gradation; but we cannot say that he never will have such means at his disposal. The difference with eikonogen is altogether inconspicuous and of no avail for practical purposes, as far as the recorded experiments go. The diagram No. 14 clearly proves this.

Now, "Free Lance" says the gradation can be changed at will. Beyond this insignificant difference? If so, let him do it; if not, why juggle with the question? There is nothing whatever absurd in my challenge; we have had quite enough of people who, in their easy-chairs languidly beg to differ from Messrs. Hurter & Driffield, find all manner of faults with their instruments and their conclusions, and, having said everything (but done nothing) to damn their work, end by expressing the greatest admiration for these able investigators. I imagine that Messrs. Hurter & Driffield care little for such praise, and that my simple statement "they have laid the foundation for a quantitative science of photography," will sound sweeter in their ears than all that has yet been said or written about them.

"Free Lance" seems in doubt whether I was guilty of rudeness to him, or of throwing "surreptitious mud" (whatever that may be composed of) at Messrs. Hurter & Driffield. I told him he was unnecessarily discourteous to them; when he cries *peccavi* I shall be happy to stand him coffee and cigars. Mr. Bolton's experiments are highly interesting; I shall try to learn more about them and their significance.—I am, yours, &c., R. C. PHILLIPS.

Arts Club, Manchester, March 28, 1892.

FOCUSSING EYEPIECES.

To the EDITOR.

SIR,—Your article in this week's JOURNAL upon "the use of focussing eyepieces," brings before photographers such a time-saving system of focussing, that I am sure none who have tried it will ever give it up.

With your permission I will explain a little dodge in connexion with the use of eyepieces, that very much increases the delicacy of the image formed.

Having carefully adjusted and fixed the focus of the Ramsden or other eyepiece, procure five circular glass microscopic slide covers (¼ inch is a convenient size), and cement them with Canada balsam on to the ground side of the camera screen, one in the centre, and the others round it about two-thirds of the distance from the centre to the corners.

The position of the view or figure can be arranged, as usual, upon the screen, which will, however, now appear to have five round holes cut through it, the Canada balsam having entirely removed all trace of "ground glass."

To adjust the focus, apply the eyepiece to the "holes," and for all practical purposes the result is a telescope, every detail will be seen with a crispness and delicacy that makes one wonder however we have previously managed to focus upon the rough surface of ground glass.

If makers would take the hint and supply the ground screen with five small polished surfaces, they would recoup themselves the extra cost by the additional number of eyepieces they would sell.

I do not claim any originality in this "dodge." It was given to me by Mr. W. Baynes, of the Torquay Photographic Society, and I have so appreciated its advantages, that I think others might be glad to hear of it.—I am, yours, &c., EDWARD J. SMITH.

Park Royd, Halifax, April 4, 1892.

PHOTOGRAPHING IN ROME.

To the EDITOR.

SIR,—In answer to G. J. J., I can say that I photographed in Rome, and have no difficulty, nor required any permit for *outside views*. For interiors a permit is required for about every building, church, palace, &c., but easily obtained from archbishops, princes, dukes, generals, &c., in charge, by calling or writing. Details for each are obtained from janitors, and a pourboire will go far to easy matters. Of Naples I do not know, but suppose it is the same as in all Italy.—I am, yours, &c., ALBERT LEVY.

Asnières, March 28, 1892.

BLACKPOOL AND NORTH-WEST LANCASHIRE ART, TRADE, AND INDUSTRIAL EXHIBITION, MAY 4 TO 28, 1892.

To the EDITOR.

SIR,—I beg to inform you that at a largely attended meeting of the Art Committee of the above Exhibition, held on Monday last, it was decided to have a section for artistic photography. This Art Exhibition, which has been held for several years, is a very successful one, and it is hoped that this decision, to include photographic art, will be appreciated.—I am, yours, &c., JOHN R. HUDDLESTONE, *Secretary.*

Winter-gardens, Blackpool, April 4, 1892.

PRINTING UNDER RED GLASS.

To the EDITOR.

SIR,—I believe it has been stated as a fact that printing under "green" glass tends to increase *contrast* in the print. Would the use of *red* or ruby glass (in place of the green) reduce contrast?—I am, yours, &c., R. MATHER.

March 30, 1892.

[It would not only "reduce contrast," but also the probability of obtaining a print at all if the glass be of the usual non-actinic kind.—ED.]

NORTH MIDDLESEX PHOTOGRAPHIC SOCIETY.—A CORRECTION.

To the EDITOR.

SIR,—Permit me to correct an error I made in reporting Mr. Beadle's demonstration before this Society. I described it as *Enlarging by Artificial Light with the Use of a Lantern.* It ought to have been "*Without* the Use of a Lantern." Thanking you in anticipation.—I am, yours, &c. J. MCINTOSH, *Hon. Sec.*

14, *Lowman-road, Holloway, April* 4, 1892.

THE WOODBURYGRAVURE PROCESS.

To the EDITOR.

SIR,—We notice a reply to James E. Gould, in your issue of April 1, to the effect that the Woodburygravure process is not patented. We therefore beg to inform you that this is an error; the process is duly patented, the specification number of which is 2211 of 1891. Perhaps you will be good enough to correct this in your next issue, and much oblige.—Yours, &c.,

WOODBURY PERMANENT PHOTOGRAPHIC PRINTING COMPANY
(Eyre & Spottiswoode).

6, *Great New-street, London, E.C., April* 5, 1892.

[The "Woodbury Gravure" process to which we and our correspondent referred is not that which forms the subject of a patent.—ED.]

Exchange Column.

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

Vogel's 12×10 triplet offered in exchange for good rectilinear wide-angle whole-plate lens.—Address, WILLIAM KIRK, Cowes.

Exchange 10×8 Kinnear camera, brass bound, double and single slides, for detective camera, or 12×10 rapid rectilinear.—Address, C., 11, Waterloo-crescent, Dover.

Wanted, Adams' Ideal hand camera in exchange for a first-rate whole-plate camera, with three double backs and solid leather case, scarcely used.—Address, A. E. SMITH, 56, Schubert-road, Putney, S.W.

THE BRITISH JOURNAL OF PHOTOGRAPHY, from 1879 to present date, cloth bound, BRITISH JOURNAL PHOTOGRAPHIC ALMANACS, same years, library bound, two *Photographic News*, half calf, all new condition; wanted, photographic apparatus.—Address, G. FRYER, Sunnyside, Endsleigh-road, Ealing Dean.

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