THE OPTICAL MAGIC LANTERN

AND

PHOTOGRAPHIC ENLARGER.

A Magazine of Popular Science for the Lecture-room and the Domestic Circle.

Vol. 3.—No. 37. JUNE 1, 1892.

Edited by J. HAY TAYLOR.

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And HORNE, THORNTHWAITE & WOOD, 41, STRAND, LONDON, W.C.
In this country, when speaking of a lantern entertainment, the pictures are in the majority of cases "projected" upon the screen, but in America, according to a programme issued by Messrs. Philip Phillips and Son, for an entertainment given lately at Greenpoint, L.I., U.S.A., "The artist will dash upon the screen some of the most wonderful transformation scenes and pictures."  

A particularly interesting set of lantern slides from photographs of a Spanish bull-fight, was a short time ago exhibited by Mr. Andrew Pringle before the Camera Club.  

A correspondent calls our attention to the fact that the film holder for lantern slides made by Mr. Albert Tranter and described on page 61 (May), is the subject of a patent, and refers us to Specification 1681 of 1891.  

The Radial Hand-camera introduced by Messrs. Marian and Co., is now being made in three sizes, half-plate, quarter-plate, and lantern size.  

Mr. T. C. Hepworth has been giving a series of lantern exhibitions at the Crystal Palace, using a specially devised form of electric lantern. An experiment was tried of illuminating the screen by lime-light, and then on the disc thus formed a slide was projected by the electric light, when even the finest details of the picture were seen with distinctness.  

Speaking of the relative qualities of lantern slides made on collodion and gelatine, Mr. Stuart stated at a recent meeting of the Photographic Society of Great Britain that he considered that collodion gave better colour than gelatine.  

Mica is said to be coming into use as a support for the sensitive film. It lies flat, and is infinitely lighter than glass.
A SECOND penny photographic weekly has made its appearance. Hitherto Photography has been the only weekly at this price, but Messrs. Piper and Carter, of Furnival-street, E.C., have just brought out Photographic Work, which is ably edited by Mr. T. Bolas.

When giving a lecture on hand-cameras, Mr. W. D. Welford thus summed up the requisite qualities necessary for a hand-camerist, "He must be of quick perception, prompt decision, and instant action, although at the same time he must be coolness itself."

Mr. A. E. Wade, of 177, Walworth-road, S.E., has fitted up a comfortable and commodious dark-room for the use of customers.

The Repeater Hand-camera described in our issue of August last, and at that time made by Mr. Cusworth, is now the property of Messrs. J. F. Shew and Co., of Newman-street, who have made several improvements, re-christened it the Repeatograph, and reduced the price from £3 3s. to £2 2s.

A novel entertainment was given by a dozen cyclists (from South Molton), at Chittlehampton, on 18th ult. A complete high-class lantern outfit was carried by two bicyclists, and each member of the band carried his own instrument. The band consisted of piano, violins, cello, cornet and flutes. Owing to the delicate nature of the instruments marked they were not carried on bicycles. The performance commenced ten minutes after the arrival of the procession. In our next we hope to have particulars of the patent folding combined lantern support desk and holder for slides employed.

In future the meetings of the Hackney Photographic Society will take place weekly, Tuesdays being the day selected. Arrangements are being made to secure premises where the comfort of "club life" may be obtained. Mr. W. Fenton Jones, 12, King Edward-road, N.E., has again been elected hon. sec.

On 10th and 17th ult., Mr. F. E. Ives, of Philadelphia, gave lectures at the Royal Institution of Great Britain, on "Projection of Photographs in Natural Colours." A report of this and also several articles have been crowded out of this issue.

Positions of Lens when Enlarging.

A correspondent asks us the following question: Given a light, condenser, picture, lens, and screen in such relation to each other that the picture is sharply depicted upon the screen; why, if the screen be farther removed from the lantern, must the lens be brought nearer to the slide in order to focus the image?

The relation of the lens to the slide and screen is dependent upon focus, so it becomes necessary to explain the term.

When speaking of a lens being of—say, 6in. focus, 6in. from the lens is the distance at which parallel rays entering it will meet or cross the axis, and if such a lens be held in front of a sheet of white paper, and rays from a distant object fall upon it, such object will be reproduced upon the white paper in an inverted form when the lens is held 6in. from it. This is termed the solar focus. Supposing, then, that with the same lens we repeat the experiment in a slightly different manner, and, instead of using the parallel rays, allow the rays from an ordinary candle, placed 8ft. or 9ft. distant, to fall upon the objective, and thence on the white paper screen aforementioned. It will be observed that the focus of the lens is now longer than when the distant object was utilised, and the nearer the candle is brought to the lens the longer will be the focus; or, in other words, the nearer the candle is brought the greater must be the distance between the lens and the focussing screen. From this it will be evident that there is some relation between the object to be focussed and the distance of the focussing screen from the lens. The relationship of the two is termed conjugate focus.

Were the condenser and objective to be removed from the lantern, and the eye applied a little distance off at the centre of the slide, the margins would not appear illuminated, as light only travels in straight lines; but all this lost light can be utilised by replacing the condensers. The one lens collects the rays which come from the illuminant and causes them to reach the second one of the condensers in a parallel form, whence they converge to the objective. The nearer the light is placed to the condenser, the shorter is the anterior focus and the longer the posterior focus, and if at the point where the latter rays meet, a sheet of paper be held, an image of the illuminant will be seen.

The objective in like form has a conjugate focus, but when considering it in connection with the light from the condenser, we have to deal not with the illuminant itself, but with the light
which illuminates the slide, and that from the position of the slide itself.

Mr. J. Traill Taylor, in his recent work, "The Optics of Photography," speaking of conjugate focus, says: "If the principal or solar focus of a lens be regarded as the unit of measure, an object situated in front of the lens at a distance from a certain point equivalent to a multiple of the said unit, will have its conjugate posterior focus at a distance from another certain point equal to a corresponding fraction of the same unit. Supposing we have a lens of 12in. solar focus, an object situated at a distance of 6ft. from a certain point in front of the lens, that is, at six times the unit of measure, the conjugate posterior focus will be at a distance of one-sixth of the same unit, that is, at 2in. distance from a corresponding point behind the lens. The point here spoken of before or behind the lens is the solar focus measured from the optical centre of the combination."

To ascertain the distance between lens and enlargement, multiply the focus of the lens by the times of enlargement required and add the focus.

Example—enlargement to be five times; lens, 10in focus.

\[
10 \times 5 = 50 + 10 = 60\text{in.}
\]

For the other conjugate focus, divide the focus by the times of enlargement and add focus.

\[
10 \div 5 = 2 + 10 = 12\text{in.}
\]

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How to Renovate a Lantern.

By C. Goodwin Norton.

No. 2.—JAPANNING.

The best lanterns are lined with Russian iron, which does not readily tarnish, as it soon becomes covered with fine dust from the lime, or with a deposit from the fumes of paraffin, either of which does not readily tarnish, as it soon becomes covered with fine dust from the lime, or with a deposit from the fumes of paraffin, either of which, while still hot, should be vigorously rubbed with a coarse cloth, a handful of shavings or paper. This process, if properly carried out, will produce on the ironwork a dull black polish, which will not smell when heated, require little cleaning, and not rust unless exposed to prolonged damp or some powerful oxidising agent.

Out of doors is the best place to try blazing off, as it creates a great deal of smoke and smell. Wood shavings, paper, or straw, will be found suitable to make the fire with. Small articles can be satisfactorily blazed by holding them in the tongs over a kitchen fire. No greater heat should be employed than is necessary to consume the grease, or the deposit will be burnt up, instead of being left on the metal. Of course, nothing but iron can be treated in this manner. Tin-plate is merely thin iron coated with tin, which would run off or form into lumps on the surface, and any article soldered would fall to pieces soon after the grease began to blaze.

To re-japan the lining, dome, and rose chimney of a lantern is not a very difficult matter, provided the lanternist has access to an oven in which to bake them after the enamel has been applied.

First clean off as much as possible of the old japan by scraping and washing in a strong solution of soda, then well rinse with clean water until all traces of the soda have disappeared, and thoroughly dry the articles in the sun or before the fire.

Black japan for the purpose can be purchased at most oil-shops. It is applied with a soft brush, just sufficient being laid on to cover; the brush marks are erased by rubbing gently all over the surface with the tip of the finger. When dry it is placed in an oven heated to a little above the temperature of boiling water, not much higher, or the solder may run.

The work should be left in the hot oven until the enamel is quite hard. The hotter the oven can be made within the limit mentioned, and the longer the japan is kept in it, the less likely will it be to chip off, or smell when heat is again applied.

One coat may be enough for old work, but for new tin-plate two or three thin ones are best.

Care should be taken when applying the japan not to put on too much, especially on the ornamental rose-top at the edges, or in the grooves where the trays slide. These grooves are often better not japanned at all, as they are never seen by anyone except the operator, and it is most annoying for the tray to jam and refuse to move, which sometimes happens when the lantern gets warm. If the lanternist has a taste for the beautiful, he may like to decorate the top and dome of his lantern with gold or silver lines or figures, which can be...
done, after japanning, by lining or stenciling with japanners' gold size. This, when dry enough to be just tacky, is covered with gold or silver leaf, or bronze powder, and then again baked, or in the case of the bronze powder or silver leaf, coated with clear gold size, and put in the oven to harden.

Before putting on the gold size to which the gold, silver, or bronze is to adhere, the japan should be dusted over with French chalk, to prevent the metal sticking where it is not wanted, and the gold size, which is nearly transparent, mixed with some pigment, such as yellow chrome, in order that the artist can see where he is putting it. Any superfluous gold size may be cleaned off with a piece of rag damped with turpentine. This must be done thoroughly, or the leaf or powder will adhere to the place. To be effective this method of decoration should be used sparingly.

Gold size can be purchased at any oil shop; a pennyworth will be sufficient for a dozen lanterns. Stencil paper may be prepared by coating thick writing or cartridge paper with turpentine. It is better to first draw the design on a piece of plain paper; lay this on the prepared paper, and cut both through together with the point of a sharp knife. Some parts of the stencil must be left to hold the paper together; for instance, in the letter O, if the lines were cut right round, the centre will fall out. In stencilling, the paper must be held close to the surface of the japan, and the gold size applied with a stumpy brush, care being taken to see that it does not get under the edges of the paper.

Gold leaf cost about 1s. 8d. per book of twelve leaves, each 3in. square; Dutch metal about 9d.; silver leaf, 1s. per book; bronze powder, either imitation gold or silver, can be had in 6d. packets from any dealer in artists' materials.

Sometimes it will be found that the japan does not dry readily; this is generally the result of the soda not having been completely washed off, or because there is some admixture of grease, most probably from the work being too much handled. Except to take out the brush-marks, it should not be touched until it is quite finished; and as the oven to be used by the lanternist will most likely be the same as the one used for domestic cookery, he should be careful not to let the work come in contact with the sides or bottom, and the door should be left open a little for ventilation.

Also, if possible, some amicable arrangement should be made with the lady, or lady-help, presiding over the cooking department of the household, as the odour of japan when baking, or being "stoved," as japanners say, is very different from that usually found in a well-ordered kitchen.
The Optical Magic Lantern Journal and Photographic Enlarger.

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the key, the lever at the register (Fig. 3) is pushed back and the index set at No. 21. The film is now ready to continue its course to the winding up roller, but at present only the black paper is opposite the lens. The length of this is gauged with such accuracy, that as soon as the index shows No. 1 (which it will do by four turns of the key), the film is in position for exposure. When making subsequent exposures there is no fear of winding either too little or too much of the film, as the stop (Fig. 3) regulates this automatically, and in this manner twenty-four exposures may be made on each spool of film. An index and lever are provided for focussing.

Fig. 4 shows the front of the Kodak when opened. The lens it will be observed is fitted with stops in the containing apertures of three different sizes. The shutter is set by pulling the cord at top until two clicks are heard, and liberated by pressing "the button" at side. Various durations of exposures may be made by adjusting the lever between F and S; but to give a time exposure, the cord is pulled until one click only is heard.

The Daylight Kodaks are made in three styles: A, B, and C, that described being the latter. The differences between the various styles are:
A, 2½ by 3½ negative, single lens, fixed stop, no focussing.
B, 3½ by 4 negative, double lens, revolving stop, and view finder.
C, 4 by 5 negative, double lens, revolving stop, adjustable speed to shutter, two view finders, and lever for focussing.

Artistic Lantern Slides.
By H. M. J. Underhill (Oxford).

No. 1.—OUTLINES, &c.

A PHOTOGRAPH is only a photograph after all, and will never be a picture, because it has no soul. Real painted pictures, therefore, will always be better and more interesting lantern slides than anything that the camera can produce. If any "lanternist" will look at some of the best "hand-painted" slides, for which is asked from £1 to £3 each, he will be convinced of this. To buy such slides is ruinous for all but the deepest purses, but any one who can paint can make slides as good as these. Such slides are usually painted in oil or varnish colours, and I do not know exactly how they are done; but water-colours have this advantage over oils—that you can work more finely with them.

The following article gives particulars of a way of painting lantern slides in water-colours, and the method is equally useful for finished pictures or for rough diagrams suitable for scientific lectures. It takes me from six to eighteen hours to make a finished picture. What a long time? True; but then—what a nice slide! On the other hand, an university extension lecturer, a friend of mine, tells me that he can paint two or three slides in an evening. He lectures on botany and physiology, and cannot get photographic slides of his subjects. Such as can be bought are photographed from diagrams and drawings, and are much inferior to the diagram painted direct on the slide.

With a little practice, pictures can be painted so smoothly that no roughness is perceptible on the screen when one is seated about three or four yards distant. And as for colour—in these pictures you have real brilliancy, and the best of coloured photographs are thick and dirty by comparison.

I have now painted some six hundred slides or more, and I have illustrated the following subjects: Scientific lectures (two or three), Japanese Art, A Tour in Norway, Hans Andersen's "Snow Queen," and some Fairy Tales. These last are immensely popular with children of all ages, from seven to seventy, and I have enthusiastic audiences. But this is enough of preface.

The first thing is the glass to paint on. This I get from E. Cutler, of Broad-street, Birmingham. It is the usual size, and is the very best patent plate, extra thin, and very finely smoothed. The grinding must be so fine that the grain is imperceptible. Of course, this glass is only semi-transparent; but the grain gives a surface to paint on, and the slide when varnished becomes quite transparent. Then you need clear glass for covers. This must be of the same best quality. The ground-glass costs 12s. 6d.; the plain, 9s. 6d. per gross. For rough diagrams cheaper glass will do. But this is always very faulty, and even the best is none too free from specks and bubbles.

We must begin by making an outline. Too much stress cannot be laid on the necessity for an exact and perfect outline. In all kinds of painting, says Ruskin, the real artist makes a true outline. In a lantern slide, where every fault will be magnified fifty-fold, a perfect outline is doubly necessary.

It is advisable to use two kinds of pencils, one
comparatively soft, the other very hard. The marks of the soft pencil can be easily washed out with benzine, and it is to be used first. This "soft" pencil is far too hard for drawing on paper. It is a sixpenny pencil, for threepenny pencils will not make nearly so good an outline. I like Cohen's pencils the best, for the marks of Cohen's H H H H are easily removed by benzine, leaving the six H marks almost untouched. Winsor and Newton's H H H H are even better pencils than Cohen's, but benzine will not remove the marks which they make. Rowney's are not adapted for the purpose. It need hardly be said that the points of one's pencils must always be kept as sharp as a needle. To do this requires practice, and the aid of a good pencil-sharpener is not to be despised.

How will you copy your large picture on to the three-inch lantern slide? If you are drawing from nature, of course you will do it in the ordinary way. If you draw from a larger picture or from the microscope, exactness may be attained by the old way of squares ruled over both the slide and the copy. But instead of actually ruling the slide itself, make a little square of cardboard. On this draw a circle three inches across. Rule this very exactly with three-sixteenths of an inch squares; that is, divide it into such a number of squares that they count sixteen each way. (See figure).

For drawing from the microscope, get an optician to make you what is known as an "eyepiece micrometer," only have it ruled in squares sixteen each way, like the figure. For drawing from pictures, make a series of about a dozen tracing papers (ordinary transparent oiled tracing paper) the smallest three and a-half inches across, the second, four inches; the third, four and a-half inches, and so on. Each tracing square and the card for the slide should be inscribed with a circle, and also with two diagonal lines from corner to corner, crossing at the centre as shown. Place a tracing paper on the picture to be copied and the glass on the card—four matches glued to the edges of the square on the card will keep it in position. If you have a dozen of these tracing papers, as described above, you can easily choose one of such a size as to suit the picture exactly. The paper must be kept flat to the picture by a plate of glass laid on it, and then you can make an outline with a very near approach to exactness. The first outline must be made with the 4-H pencil. Then remove the slide from the card and the tracing paper from the picture, and mend the outline with the same pencil.

Any incorrect strokes may be erased by rubbing with a small hog-hair paint-brush moistened with benzine. Then go over the outline carefully and firmly with the 6-H pencil. Finally pour a little benzine on the slide, and rub it gently with the finger until all the marks of the 4-H pencil are removed, and a clear very thin outline of 6-H pencil marks alone remains. If the benzine will not remove all the 4-H marks in any place where the paint will be thin, or absent altogether, they may be quite removed by a point of "ink eraser" (artificial india-rubber) moistened with water.

(To be continued.)

**Mounting Paste for Lantern Slides.**

*By M. V. Portman.*

For attaching lantern slide bindings to the glass nothing is better than bichromated paste, which is used for attaching paper to glass in the manufacture of electric instruments, and which is a most useful paste for many purposes in damp climates. It is made as follows:

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flour</td>
<td>2 tea-spoonfuls</td>
</tr>
<tr>
<td>Water</td>
<td>7 oz.</td>
</tr>
<tr>
<td>Bichromate of Potash</td>
<td>5 grains</td>
</tr>
</tbody>
</table>

The flour must be rubbed to a smooth paste with the water, then placed in a saucepan over the fire and kept stirred until it boils. Add the bichromate slowly, stirring all the time; then stand to cool.

This paste must be kept in the dark and used as soon as possible. Soak the paper in it and attach to the glass, then place in direct sunlight for a day. This sets up a chemical change in the bichromate and renders the paste insoluble.
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THz country at large, and amateur photographers in particular, we feel sure, will note with much satisfaction that Mr. W. L. Chadwick, of St. Mary's Street, Manchester, has taken up, with a firm attitude, the revival of the Stereoscope. For many years this once most popular instrument has been sadly neglected, but with the recent improvements introduced by its present leader, a gentleman well-known for his scientific attainments and enterprise, there can be little doubt that ere long stereoscopic photography will be the most popular amongst amateur photographers throughout the world.

The House of Commons sat till four o'clock yesterday morning. The later hours of the sitting were occupied with discussion on motions to report progress, which were resisted, and which were defeated.

WICK

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NICE: Place Grimaldi,
Tinters and Lacquering.

BY JOHN T. BOYDE (ISLE OF MAN).

As an old lanternist of twenty-five years' standing, I naturally take a great interest in the subjects that are treated upon from time to time in The Optical Magic Lantern Journal, to which I have been a subscriber since the first issue.

I think I can, without egotism, pride myself that some of the foremost lantern exhibitors of the present day are indebted to me for their initiatory lessons, and also for a bi-unial lantern which I constructed some twenty years ago, there were to my mind some indispensable improvements, for which I look in vain in the commercial triple and bi-unial instruments of the present day.

I am now prompted to write in reply to Mr. Lowe's inquiry concerning pale blue and other coloured tinters for the lantern. In last issue there were three replies, but not one of them was satisfactory. I have tried many methods in my time, but I have found that the very best results in the way of tinted light can only be attained by the use of the Dalton Patent Cold Lacquer. This is an invention of recent date, and is manufactured by the Dalton Manufacturing Company, Manchester. The company will supply the glass tinted to any shade that may be required, or will supply the lacquer in any colour, put up in shilling bottles. The lacquer can be easily applied to the glass by anyone after the manner that collodion is applied, that is, simply floated on and drained off. It is very convenient to have a bottle of crystal lacquer, so that the colours can be reduced to the exact shade required by an exhibitor. These lacquers, when applied to glass, are much more transparent than either gelatine or stained glass, and are in consequence now used in many theatres for coloured lime-lights.

I have been much pleased with reading the chapter in your last issue by Mr. C. E. Norton, on "Lantern Renovating," in which the author intimates that the lacquer for brass work is practically identical with french polish. From this I take it that Mr. Norton has not yet heard of the Dalton Patent Cold Lacquer, which is now used for bright metal work by many leading opticians, instrument makers, and others in the provinces. The cold lacquer has this advantage—it can be applied without any heating or stoving of the metal, dries perfectly transparent in the coldest or hottest climate, becomes very hard in a short time, and no matter how roughly applied, will, in twelve hours, present a uniform even coating, free from streaks or blotches of any kind. To all lantern makers and lantern owners I am sure this will be acceptable news, as any tyro can use the lacquer, the only condition being that the metal work be polished brightly and cleaned with some acid, such as lemon juice, before the lacquer is applied. The various tints in which the lacquer is supplied for brass work, will commend it to the tastes of all who may require to use it. I know a firm of nautical instrument makers who have a special tint manufactured for their sole use, so that their goods can be known at a glance by the shade of the lacquer.

May I venture to ask that before Mr. Norton writes his chapter on brass work, he will give a trial to the cold lacquer, so that the readers may have the benefit of his experience and criticisms. I feel convinced, by my own trials, that he will appreciate the convenience and saving of time and trouble its use will give to amateurs, especially while the finish and lustre it gives to all bright metal work, either brass, copper, nickel, steel, or tin, is quite equal if not superior to the results obtained by the troublesome and expensive methods of old-fashioned lacquering.

A Word in Season.

STEREOSCOPE AND LANTERN.

BY EDGAR CLINTON.

Not without a pang has the ardent lanternist laid aside his cherished companion until shortening days and cooler evenings again induce his friends to gather before his spotless screen, and lavish their praises on the specimens of his skill. But let him not despair and feel that during the summer he is being eclipsed by his brother photographer who has a bigger camera, and prints his pictures on paper, for if he will but turn his attention to the stereoscope as a means of showing his pictures, when the lantern is not available, he will find that his work is in no danger of being overlooked.

A few years ago a well-known photographic writer mentioned a visit to a prominent optician in search of a stereoscope. He humorously said that when he asked for the instrument the assistant looked at him as if he were a pelican from the "Zoo." This would hardly be the case now, for, thanks to the constancy of a few workers, the sacred fire of stereoscopic work has been kept smouldering, and if it has not lately been fanned into quite a blaze by our worthy friends in the provinces, it is at all events in less danger of being extinguished than it has been for many a year past.

A combination of apparatus or appliances to serve more than one purpose has had, and probably always will have a charm for the average man, or else why have we book-cases that will turn into bedsteads, railway keys that are screw-
Jantern and the stereoscope: the pictures are required in both cases, and the printing process which will give a good transparency for the one instrument will give an equally good one for the other.

One great advantage in connection with stereoscopic work is that it entails little, if any, additional expense upon the possessor of ordinary photographic apparatus, although to produce many of the most interesting pictures a pair of accurately-matched lenses is an absolute necessity. Nevertheless, the lanternist, who can often only boast of a quarter-plate camera, can, if he will confine himself to architecture, landscape without figures, and still life generally, make a collection of stereoscopic slides quite indistinguishable from those taken in the more usual manner—i.e., with a binocular camera.

The only addition required to the outfit will be a strip of wood say ten or twelve inches long, which can be attached to the tripod head by the ordinary camera screw, so as to form a little table, provided with a slotted hole at each end, and a thin strip of wood or other stop to ensure the camera being correctly adjusted for the two exposures which are required. The procedure is now simple; the operator has only to adjust his camera at one end of the table, and to take his negative in the ordinary way—unscrew the camera and fix it at the other end, and repeat the operation. The result will be a pair of negatives, either of which will answer for printing lantern transparencies from, while the two in conjunction are equally available for making stereoscopic slides on glass or paper. The owner of a half-plate camera has only to place a flexible division so as to divide the interior of the camera into two parts longitudinally, and if the camera is not already fitted with one, to adapt a sliding front permitting such an amount of movement as will allow the lens to be brought exactly opposite the centre of each half of the plate in succession. This system is distinctly in advance of that described above, but still limits the worker in his choice of subjects, as even with the most expert operators several seconds must be occupied in altering the position of the lens for the second exposure.

When moving objects have to be dealt with a matched pair of lenses becomes indispensable. They can be fitted to any camera of the half-plate or larger size, the central partition is necessary, and the lenses should if possible be mounted so as to allow them to be separated, more or less, according to the exigencies of any particular case. It must not be supposed, that a matched pair of lenses is necessarily expensive; some of the most successful pictures the writer has ever taken being made with a pair of single lenses fitted with revolving diaphragms, and costing only 10s. 6d. each, retail.

Presuming that the reader is already au fait in lantern transparency making, it is not necessary to give any details of the process of stereoscopic slide making, as it is practically the same, the only difference being that the stereoscopic slide should be soft and full of detail, while it is at the same time brilliant. Hardness and chalkiness are much more noticeable in the stereoscope than in the lantern.

It is impossible within the limits of a short article to give working details and measurements, the idea being only to suggest stereoscopic work to many photographers who have been deterred from attempting it by the fear that it necessitated an elaborate outfit and preparations.

A PRIZE

Of a Mahogany Lantern will be given for the best Set of Lantern Slides (Photographs or Sketches), as stated in last issue, to illustrate the following Narrative. All Slides must be sent to the Editor on or before Sept. 12.

The Punishments of Sunday Travelling.

BY J. HUBERT (HACKNEY), AUTHOR OF "THE ART OF RE-TOUCHING," &C.

I am a young married man from the country, not used to London ways and to warn my fellow-creatures who may visit this great Metropolis against Sunday experiences, have written the following narrative.

It was in the summer of 1890, on an alternately hot and cold afternoon, such as we have grown accustomed to during that memorable season, when heavy overcoats and fur jackets mingled with sunshades and umbrellas, when my wife and I solemnly determined at all hazards to probe some variation in the monotony of Sunday life in this vast Metropolis. My dearly beloved accordingly left me still perusing the "Pilgrim's Progress," whilst she went up-stairs to look after her toilet.

Dosing off and dreaming that the angels were getting dangerously high on Jacob's ladder, I was suddenly roused, fancying I heard the sweet sound of my Maria's voice. It was reality—the dear creature called out to me to make haste and don my new cape coat, which was deemed indispensable to uphold the dignity of the family, put the latch-key, ham and eggs, bread and butter, and such other small articles as contribute to the enjoyment of mortal man, into my several coat pockets—which already bulged...
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out with a pound or two of apples, and a bottle of what I shall term filtered water—and await her appearance in the hall.

As last she made her appearance in her new bonnet, and in company with our son, we made a start, after several stoppages, the details of which perhaps will not burden my hearers with, but which briefly stated, consisted of sundry trips, such as to inquire whether the coals might not be liable to drop out of the grate and set fire to our new hearth rug—which, by-the-by, was got together after a great deal of shopping for samples of cloth—or whether there was any chance of the cat mixing the suppers at the super table, and to see that the locks and bolts were quite secure.

Being eventually satisfied that everything was right and safe, we got clear of the house, and hailed the next 'bus to the City. My wife, son, and self, climbed to the top of the vehicle, which, starting somewhat unexpectedly, deposited my poor Maria into the lap of the nearest gentleman, much to his and her astonishment. With many "Beg pardons," "Now, really it is too bad," and such like exclamations, we managed to take our allotted seats, and lunched with unwilling ears to the expostulations of the conductor for not setting passengers down at their destination, but nothing else of particular moment happened except the trifling one of a gent having forgotten to replace a lady’s purse, and a few blessings bestowed upon the conductor for not setting passengers down at their destined destinations; however, I presume these are everyday items connected with ‘bus travelling.

Conductors are not so bad when you know them, and I learned that the Queen’s effigies upon a round copper plate (two are better) works wonders.

It was now necessary for us to go in a different direction, so we hailed another ‘bus, but the conductor merely said, "Full in and out." I tried two effigies, and it worked wonders; the tone of the gentleman in charge completely changed, and at intervals he ratted on like this: "Yes, sir; nice day, sir. ‘Bus full, sir—find room for you, sir. Nice boy, your son, sir. See that woman, sir—wants to go to Whitechapel. Stops this ‘bus going in the contrary direction. The world is made up of fools, sir." This was the style of conversation indulged in by our friend. Having finished our ride, accompanied by the conductor’s good wishes for a pleasant day, we proceeded on foot towards London Bridge Pier, en route for Battersea.

Toot! toot! toot! A bicycle close upon us, my wife nearly under it, myself the other side, and the dear boy knocked over by the same agency. I picked up my son, and took hold of my wife to pull her one way, but she contrary, like all ladies, not wishing to be pulled, pushed me under a passing hansom-cab, which pulling up suddenly, just allowed me to crawl from under its wheels, but not without a number of apples rolling out of my pocket. Alas, for my dignity!

Nevertheless, I pulled myself together, and went in search of my family. Ah, there they were, standing on the pavement. My wife greeted me with “You stupid man; you catch me going out with you again on a Sunday.”

The pier was now in sight, my little fellow and myself were in high glee to fly from the dangers of terra firma, but my wife unfortunately has a great dislike for the water, and says when she ventures upon it something is sure to happen. She, I may remark, was born in 18—, but I’ll not enter into further particulars, but it was when the planet Neptune was in one of his worst moods. She felt certain we should have a storm soon, but I looked for it in a domestic sense, and not with regard to the elements. I felt it drawing. There, I knew her of old.

In answer to our inquiries on the pier, we were told, “Battersea boat just gone, sir. Only half-an-hour to wait, sir.” One of the pier attendants volunteered, in answer to my wife, “Pleasant breeze, ma’am; not much sea-sickness to-day.” And my wife, asking the man if he is sure the steamer is a safe one, is assured by him that the one starting next has just been repaired all over, even to the extent of a new bottom, as the old one was on the verge of falling out the other day; “but,” he added, “there are always plenty of cork-jackets and life-buoys around, in case anything should happen.”

Just then the bell-ringing, in conjunction with a tremendous shock, which interrupted the conversation, reminded us that the boat was alongside. My wife felt rather inclined to return from whence she came, if that had been possible; but there was no trifling with such a crowd whose watchword seemed to be “Forward.” My wife, after getting on the boat, stood on the small platform at the end of the paddle-box, to wait until I got aboard.

One of the sailors roughly said, “Now then, ma’am, get on with you. Want to be drowned?” I came up at that moment, and angrily retorted, “Don’t be rude to my wife, sir.”

“Git yer’air out” was the only response.

Well, we got safely on the boat, but not without certain damage to my wife’s finery.

“I declare, Joseph,” she said, “if ever I get home alive, no more Sunday travelling for me.”

By degrees the whole crowd managed to get on board, when the captain practised some kind of ventriloquism down a pipe, which was immediately followed by a roaring sound from below, and a splashing from the paddleboxes, and the Fire Queen moved away majestically, as, of course, Fire Queen should do.

There, there, Joseph,” shouted my beloved Maria, “haven’t you always said that Sunday travelling brings no good? There, that lady will wish she had stopped at home, saying her prayers all day, rather than losing that pretty bonnet—a prey to the merciless waves.”

“Oh,” I retorted, “that can easily be picked up with a long harpoon, dried, and—”

“You foolish man” was the wifely rejoinder, “it is plash and tulle; completely spoiled—done for. Oh! oh!”

I did not know that plash and tulle were ruined by a bath; but when I saw it far astern, I mused, “It may be plash and tulle; but it’s too late to pick it up now.” This was a mental joke only. I dared not utter it, for the silence of the multitude was broken only by the sobs of the bonnetless woman.

“Well,” said I, at last, addressing Maria, “this catastrophe can only be met with” —I meant to say “resignation,” but before I could utter it, my better-half completed the sentence with, “A new bonnet,” when at once the enormity of the loss dawned upon me, and I realised the disaster in its fullest extent, for before my mind appeared visions of bonnet accounts I had to pay.

My thoughts were suddenly disturbed by the woman loudly imploring the captain to land just there, or lower a boat, for she had a relative who lived close by and she might...
borrow a bonnet; and I certainly considered it extremely rude for some boys to emphasise the captain's polite refusal with the horrid "Git yer 'air cut."

"We had now passed two or three piers, but how the news could have spread so quickly my wife and I were at a loss to understand. However, it was evident that it had, for at the next landing a newspaper reporter came on board and interviewed the bonnetless dame about the matter and the exact circumstances of her loss. Such publicity being too hard to bear, she fainted and had to be carried downstairs.

What became of her afterwards, the inextricable torrent of subsequent incidents prevented my wife from ascertaining, she being just then very much engaged in listening to an altercation between two "gents," one of whom, having left his seat, was asking the other, on returning, what business he had to take it. In answer to which the other wanted to know what he meant by his impudence, whereupon the former told him he would let him know later, which delay the other gentleman was not prepared to stand. The matter in dispute became so interesting, both in word and deed, that I was quite unaware of what was going on at my side. A little family pet — I mean — a baby who had been kept in proper order until the altercation between the two gents in question, attractive for the mother, took advantage of its freedom from maternal bondage and, I scarcely know how to relate it, having walked along the seat was, with one hand, drawing fancy patterns on my frock coat with a huge piece of bread and jam, and with the other pulling my whiskers.

As a father, I suppose I ought not to mind these little attentions; but it is rather annoying to be thus ornamented when there is no place of retirement to change and wash one's attire, and no sun to dry one's garments.

"Bump, a broken nose! Oh, how I dislike fighting, and Sunday fighting above all. By the way, I cannot fight; but it does not do to let everyone know, so I came boldly forward with the intention of stepping between the combatants, who were causing the crowd to sway backwards and forwards, my face burning with indignation. There was no danger for me, as I could not get near the pugilists, so desperate was the crowd; but I felt exceptionally brave and heroic, and there being such a splendid chance to play the hero cheaply, I made a rush forward, crying "Shame! shame! stop them;" but my dear Maria embraced me tightly, saying "Dear, dear, don't; fighting is dangerous. For the sake of our dear boy, oh! don't!"

Who could resist such an appeal? After an interval we were again in a thick crowd, my eyes wildly, I consented, for the sake of the dear boy and Maria not to interfere further. Then followed an outburst of the crowd with sundry exclamations, such as "Go it, Joe," "Rally," "Turn it up," &c., but as neither took the advice offered, it only terminated when some bones had been broken.

The crowd now opened up a little, and having, with great difficulty, obtained my wife's permission, I, the only member of St. John's Ambulance present, hurriedly wiping the surplus butter and jam off my coat, made my way to the scene of action, looked gravely at the disabled man, and felt his pulse. With great presence of mind I ordered a glass of water, put a tourniquet round each limb from which the blood was flowing, and twisted the bandage until the flow ceased. Suddenly the man turned black and blue in the face, showing to my practised eye that the tourniquet required to be loosened, and this I managed just in time, and so restored the man to life.

Now fancy a boat literally overladen with holiday folks all making a rush to one side, it was only prevented from capsizing by the crowd making a rush across the deck as the boat containing the race was, turned up on the other side, as many of the passengers fell during the rush. The oscillation of our boat was not so great as it might have been. The captain with great presence of mind commanded the people to remain just as they were for a few minutes, so as to give the boat time to steady itself. Scarcely had the excitement reached its height and people been restored and the mutual congratulations passed, for being thus saved from what might have been a watery grave, Chelsea Bridge came in sight, and awful to relate a party of children were beheld leaning over the parapet preparing to bombard the multitude passing below with mudpies, turf, flour and eggs of not too choice a sort. I had only just time to expand my umbrella over myself, Maria, and the boy, when the aforesaid missiles dropped upon the astonished and unsuspecting assembly. "Did you ever?" exclaimed one corpulent lady, "No, I never," responded another who had escaped injury, whilst a little dignified and important-looking gentleman quite forgot himself so far as to utter words which I sha'd not repeat, but which were unwarantable, notwithstanding that his coat bore traces of flour and eggs. One lady called loudly for a policeman, evidently little thinking that as it was a difficult matter to find one on dry land, it would be an impossibility to find one when on the water.

At that moment the band struck up a lively tune; perhaps you may like a description of the band. Well, they consisted of three seedy-looking individuals, with red, or rather purple, noses; and the instruments consisted of a hautboy, clarionet and cornet.

In a few minutes we neared Battersea Pier, and as soon as we got alongside we felt a slight shock, which was visibly shared by the landing-stage and boat. This pointed to the inevitable conclusion that in a few moments we should be again on terra firma.

Again for human predication. For every passenger waiting to get off there were ten waiting to get on; and it is hardly to be wondered at that between these two crowds the ticket collector and pier constable got wedged. The crowds disregarded all authority, and, pressing forward, had met in the centre of a not over-strong landing bridge. But this was not all; a crowd, every member of which wants to be among the first to get on board, is not to be trifled with, and when they are imbued with the idea that "waiting would be vain," the results are almost too terrible to contemplate.

The scene that did ensue then I could previously only have attributed to the fertile brain of romance writers. But in my turn position I even felt it, and in such a situation feeling is believing, much more than seeing.

"I'm a rather bashful man, but on that occasion I became brave. It's no use to be otherwise when you experience the same feelings as your neighbour, who, to use her own words, shouted loudly, "I'm

Maria; there she stood, and when I came to where she was
squashed. I'm flattened. I'm dead." The former remarks I quite believed, but the latter was somewhat of an exaggeration, because the same party in trying to elbow past me was capable of inflicting bruises which I felt for a long time afterwards. With such a crowd there is no time for courtesy; it is everyone for himself.

I speedily came to the conclusion that to reach the gangway would be a matter of some considerable time and attended with a small amount of danger, as we were far distant from the means of exit, and at the side of the boat next the pier; but a happy thought occurred to my mind, and I took my son, and by means of a vigorous push which lent considerable aid to a jump on his part he was safely landed on the extreme end of the pier, and finding himself ashore at once disappeared to enjoy himself.

After a great deal of persuasion I managed to get Maria to land in the same manner, and she not being so agile as our son and heir, I had to give her an extra push so as to ensure her landing at the desired spot. However, she just managed to land at the edge, and in trying to keep her balance it was doubtful whether she would fall into the water; however, as the balance was the right way she arrived on the pier in what cannot, however, be described as a graceful position.

Having thus got my family safely landed I proceeded to convey myself from the boat to the pier, and being of rather a stout build, and not having the amount of pring that I possessed when I was younger, I began to consider the probability of my impetus not being sufficient to enable me to reach the pier, in which case it meant falling into the water, and this with one's best clothes on, and many miles from home, was not calculated to ease my frame of mind, but I prepared by swinging my arms backward and forward for a good leap, and I am happy to say that I fulfilled my most sanguine expectation, and was once more besides my wife, "safe from the madding crowd."

But the boy, where was he? To find him was our next task. As he responded not to our calls, we went in active search of him, and eventually found the young rascal perched upon an eminence of the bridge, singing one of the popular songs which one hears every few minutes, and finding himself ashore at once disappeared to enjoy himself.

After our experiences of the voyage we returned home, not by steamer, but by train.

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Editorial Table.

CATALOGUES.—Messrs. J. Lancaster and Son, Birmingham, have sent us their new catalogue, which contains particulars of their popular photographic sets, lenses, stands, hand-cameras, lanterns, and fittings. It also contains some pleasing illustrations of pictures taken with hand-cameras, and is a masterpiece in printing and get-up.

WORKSHOP RECIPES (Messrs. E and F. Spon, London).—The fifth series contains interesting information relating to diamond cutting, laboratory recipes, copying, filtering, fireproofing, magic lanterns, metal work, illuminating agents, boat-building, and a host of other subjects. Price 5s.

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Correspondence.

THE PHOTOGRAPHIC CONVENTION OF THE UNITED KINGDOM.

[To the Editor.]

DEAR SIR,—Pending the issue of our programme, which will be ready by the beginning of June, I ask you now to publish, for the guidance of your readers who are members of the Convention, the following particulars of the excursions, dinner, group, &c.:—

On Tuesday, 13th July, there will be an excursion to Melrose and Dryburgh.

On Thursday, to St. Andrew's and Dumfriemine.

On Friday to Dalmeny and Crondam Bridge, and to Rosslyn and Hawthorneden.

The group will be taken on Wednesday, at noon, probably in Princes-street Gardens.

The dinner and smoking concert will be held on the Friday evening in the Waterloo Hotel.

The headquarters of the Convention at Edinburgh during the week of the meeting, will be at the Royal Hotel and at the Waverley Temperance Hotel.

Thanking you for the publication of this letter, I remain, yours faithfully,

F. P. CEMBRANO, Jun., Hon. Sec.

10, Cambridge Gardens, Richmond, Surrey.

FINGER-MARKED SLIDES.

[To the Editor.]

SIR,—The thought has struck me that in order to prevent marks being made on slides by "perspiry fingers" in a hot room, it would be a good plan to wear a cotton glove in the right hand. By so doing the making of such finger-marks would be prevented.—Yours, &c.,

ALBERT TANTER.

Saturators, Patent Rights and Benzoline.

[To the Editor.]

SIR,—In the May number of the Optical Lantern Journal appeared a description of an alleged "new" saturator, designed by Mr. W. Lawson, but which is but a modification of the warm-air saturator for which I hold a patent. The difference is merely in the shape; instead of cylinders, Mr. Lawson uses square or oblong vessels, the lantern body forming the outer vessel, and the lime-light being used as a source of heat, instead of the night-light.

The following extracts from the patent specification of the warm-air saturator will show how little difference if any, there is between the Mr. Lawson's saturator, and the patented one:

"The saturator consists of a closed vessel of hard material, preferably metal, of any convenient shape; such as cylindrical, although vessels of square, oval, oblong, or other sections will answer; and combinations of cylinders or tubes may be adopted, when a large heating surface is desired. The size of the vessel may also be varied, according to requirements for lime-light purposes, a liquid capacity of from half-pint to three pints will be suitable...

"The saturator vessel is filled and tightly packed with porous stuffing, capable of absorbing benzolene fluid.

"When required to impart an increased amount of hydro-carbon vapour to the gas, the vessel is wholly or partially surrounded by a second vessel, so that a space is left between them for water or air."

The second claim of the patent is as follows, stated in full:

"2. A saturator for imparting hydro-carbon vapour to suitable gases for lime-light and other purposes, consisting of a packed vessel supplied with hydro-carbon liquid, and with inlet and exit pipes by means of which the gas to be saturated can be passed through the said vessel, and of an outer casing surrounding or partially surrounding the packed vessel, and through which a current of hot air can be passed, or which is filled with water heated by a night-light, or other suitable source of heat, the whole substantially as described with reference to the drawings."

The chief objection to putting the saturator inside the lantern is that there is no means of readily controlling the amount of warmth imparted to the saturator; it is too cold at the start, and, with a powerful lime light, it
of valuable fluid and coal gas, etc., and would be too hot at the finish. With benzoline in cold weather, it would be difficult to get it lighted, as that fluid gives off very little vapour at low temperatures; while with ether the heat is liable to be unmanageable, as the only way of reducing the heat would be to put out the light for a few minutes.

Mr. Lawson claims to have obtained a light of great brilliancy; but, judging from the great amount of benzoline consumed—5oz. or 10oz. in three hours—it is difficult to believe that the light could have exceeded three hundred candles at most. The smaller size of warm-air saturator, which is stated to last two and a-half hours, with a good light, has a capacity of over fifteen fluid ounces.

Mr. Lawson asks information about benzoline: he says he finds some kinds better than others. The quality is really the same; but benzoline is not a single homogeneous fluid, but is a mixture of several fluids, similar in nature, but differing in their degree of volatility; and some samples contain more of the volatile liquids than others do, and would therefore give off more vapour at the start. But if the saturator is properly warmed before starting, as with the warm-air saturator, any kind of commercial benzoline will give good results.—Yours, &c.,

ALBERT W. SCOTT.

SATURATORS.

[To the Editor.]

Sir,—The recent discussion in your journal respecting "Saturators," leads me to address to you a few words upon the subject. My experience has been chiefly with the blow-through jet, which for all ordinary purposes I hold to be the best; but, living in the country and having no house-gas, I have had none means of lighting up at home but the lamp, to which one does not return with very kindly feelings after being used to the limelight. When saturators were introduced I saw at once how completely they met my want. But the warnings as to their danger, which I met with in many directions, made me hesitate. Recently, however, I decided to venture, and as I am accustomed to make a good deal of my own apparatus, I soon put together a saturator, and "mixed" it to correspond. The result of several trials which I have given at home, is, that I am almost entirely satisfied with its performance. Only once did it refuse to work well, and persisted in "popping"—or rather "cracking"—when I turned on the oxygen, and that was due largely, if not altogether, to a defect in the jet, which I soon saw and remedied. I got a steady and reliable light; certainly more powerful than the "blow-through." My small experience, leads me to the conclusion, that the conditions of success lie within somewhat narrow limits; but that within those limits the light is a useful and valuable one. The whole affair cost me only a few shillings, and if you think that it might help any of your amateur readers, I should be happy to send you a few brief particulars as to its construction.

Yours faithfully,

CLERICUS.

[We shall be pleased to have the particulars of the saturator mentioned, for early publication.—Ed.]

Notes and Queries.

Mr. R. R. Board, of 62, Alscoft-road, Bermondsey, informs us that owing to the "6" having been drawn out of his advertisement when printing last issue, several letters have been addressed to him at No. 2, and that customers have also been inquiring for him at that number. We regret the error.

T. White.—We can only say that the firm mentioned bears an excellent reputation.

Clericus.—(1) No, we do not think it can come under the heading of "Dangerous," but of course it is desirable for one to know its principles before employing it. (B) It should be depended upon about three hours with one charge. (C) The most effective flame extinguitor would appear to be that suggested by Mr. A. W. Scott—namely, cotton wick damped with glycerine. See append to your letter on another page. Send a sketch if possible.

J. G. Thompson.—(1) The three taps placed one on top of the other would be effective, but somewhat bulky. (2) You can make a large screen fit a small frame by putting a series of tapes on the back so as to secure it in its place. (3) The pump described in May, 1890, issue, for charging cylinders is made by Mr. C. T. Milligan, 728, Chestnut-street, Philadelphia, U.S.A.

J. G. Gibson.—We understand that Mr. Walter Tyler, of Waterloo-road, London, has a few numbers of No. 1 of this Journal; write to him.

W. A.—Your question could not be answered in the space at command in this column, but being of special interest, we have devoted the first article to the subject.

J. G.—The wicks should be dried after soaking in vinegar before being put in the lamps; if they could be used wet, one might just as well expect to burn water instead of oil.

Wm. Boot.—(1) We gave Mr. Lawson's address in last issue, see "Notes," p. 32. (2) Either a large or a small cylinder will answer for single lantern; the only difference is that one holds more than the other. Twenty feet is a convenient size.

A.—In order to secure the copyright of a set of drawn slides, a photograph of each design must be registered at Stationers' Hall in the name of the individual who sketched them, and the copyright then transferred to you.

B. Hauzwell.—We thank you for the suggestion, but the alteration must be left a little later, for, as everyone understands the one, few in comparison would grasp the other. We have to cater for all kinds and conditions, but will take your suggestion into consideration.

B. M.—The first number of this Journal was published in June, 1889.

G.—(1) It is only a matter of opinion, and we are satisfied no good would result from the publication of your remarks. (2) The difference, if any, would be very small. (3) We cannot quite follow your remarks about all dealers making lanterns of the "same shape and pattern." In a short time we hope to give illustrations of a few lanterns of an entirely new configuration.

Inexperienced.—The cause of your disc being surrounded by a dark border, is the light being too close to the condenser. Withdraw it until the disc is quite clear.

J. McGehe.—(1) We do not deal in lantern and photographic apparatus. Consult our advertising columns. (2) Adams and Co. (3) We have never tried it.

Reader asks us to insert the following questions:—"What depth is the 4-way dissolver? What is the best way of utilising a screen 30ft. square for a 25ft., 20ft., 15ft. or 10ft., providing a screen elevator made of poles is used? I am afraid, if a series of tapes were placed on the other side, it would show when screen is used in full. Are the 6in. and 8in. double achromatic front lenses capable of being screwed together so as to form one lens of 14in. focus, and would this give a better definition on the screen than the one double-front lens?"
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The quarter-plate (for pictures 4½ by 3¼) has a range of focus from 3 to 8½ inches, and measures closed 7¼ by 5½ inches.

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