THE PRACTICAL PHOTOGRAPHER

(LIBRARY SERIES)

EDITED BY REV. F. C. LAMBERT, M.A.

NUMBER 8

The Pictorial Work of
Frank M. Sutcliffe.

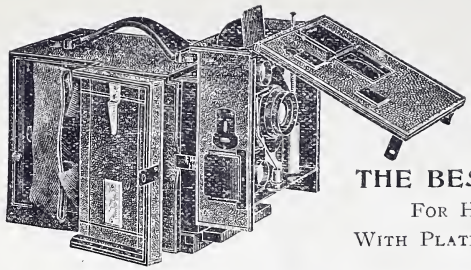
Hand Camera Work.

Plates and Films.
Choice of Camera.
Focussing Scales.
Pictorial Hints.
Tables, Etc.

Awards.
Spring Junior Salon.
P.O.P. Competition.
Print Criticisms.
Etc.

HODDER AND STOUGHTON.
27, PATERNOSTER ROW, E.C.

May 1904



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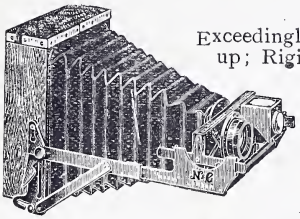

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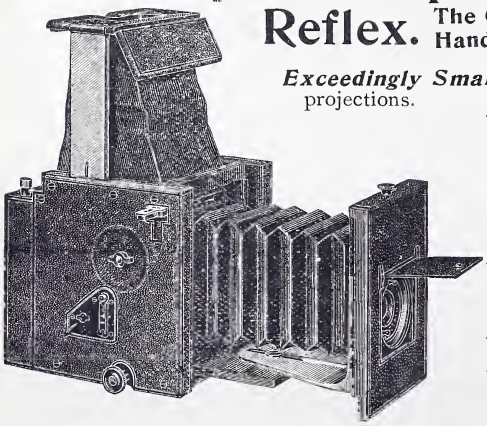

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The Practical Photographer.

Library Series. Hand-Camera Work. No. 8

Principal Contents.

Illustrations.

Editorial and other Notes.

Contents of Our Next Number.

The ninth number of the present (Library) Series of *The Practical Photographer* will deal exhaustively with the widely popular subject of **Platinotype Printing.** (*Ready June 1st.*)

Our Tenth Number will be a **Special Holiday Number** devoted to Holiday Photography; Where to go; What to Photograph; Exposure Notes and Hints; Permits; Developing Dodges when away from home; Touring Hints; Anything and everything that one wants to know when taking a **Holiday with a Camera.** Several important matters in connection with **Hand-Camera Work** which have been crowded out of this present number, will be included in our Special Holiday Number.

Other Numbers in active preparation will be devoted to **Architecture, Portraiture, Landscape, Marine and Seaside Work, Animals, Ozotype, Gum-bichromate, Carbon Process, Retouching, Lenses, Telephotography, Stereoscopic Work, etc.**

N.B.—Will readers who feel disposed to submit short notes on any of the above subjects please communicate with the Editor without delay?

Hints for Intending Contributors.

The Editor will be pleased to carefully consider MS. bearing on any of the subjects announced. Preference will be given to MS. characterised by the following features:—

1. New or little known methods; formulæ personally tested.
2. Short sentences and simple language, with diagrams when needed.
3. Brevity so far as is consistent with clearness. The first and last pages of the MS. should bear the sender's name and address. The approximate number of words should be stated. Contributors may, if they please, send a brief outline or synopsis of their proposed contribution.

The Editor cannot undertake any responsibility whatever in connection with MS., but if stamps are sent for return postage, he will endeavour to return as quickly as possible any MS. not accepted for publication. MS. should reach the Editor not later than **six weeks** before date of publication.

Intending contributors will also find that it saves themselves trouble if they will send to the Editor an *outline* of their proposed communication at the earliest possible date, so that arrangements may be made to avoid overlapping by two or more contributors saying the same thing. In this first communication any proposed diagrams may be merely rough sketches.

In general it is well to put any drawings or diagrams on separate sheets, and not interpolate them with the matter.

The MS. pages (which may preferably be typewritten) should have a clear margin of quite an inch left blank along the left-hand side of the page.

NOTE.—It would frequently save disappointment and the return of MS. if authors would state their willingness for extracts to be made from their contributions if the contribution cannot be accepted in its entirety owing to overlapping or duplication of portions by other contributors.

Criticism of Prints.

It is our desire to make the criticism of prints a special feature in our pages. The Editor gives his personal careful attention to this matter, and aims at making every criticism a practical, interesting, and instructive object-lesson. By paying attention to the hints thus given, often a poor print may be improved and a good print followed by one still better. In order to encourage readers to take great care in the preparation of the prints they send us, we offer **Three Prizes of Five Shillings** each for the three best prints sent in each month. The winning prints will not be returned.

Champion Class Competition.—Preliminary Notice.

We are arranging a novel competition which will only be open to those of our readers who have obtained a place on the Roll of Honour as winners of our Plaques, Certificates, Print Criticism Prizes, or Honourable Mention. This competition will take place towards the end of this year. Due notice will be given.

Spring Junior Salon: Awards.

We are glad to announce that the entries for this competition considerably exceeded our anticipations, and still more glad to say that the general quality shows a marked advance on the previous Junior Salon. Mr. G. A. Storey expressed much gratification at the artistic taste and skill displayed in a large proportion of the prints. Every one of those whose names are included in the **Roll of Honour** may very justly feel proud to have earned recognition by so eminent a Professor at the Royal Academy.

The plaques and certificates will be sent to the recipients at the earliest possible moment. In our next few numbers we hope to reproduce as many of the award-earning prints as we can possibly find room for. We are particularly gratified to find that one silver plaque goes to a lady, a bronze plaque to another lady, while certificates go to two others. Another lady is among the highly commended.

Silver Plaques.—E. Seymour, "Roses"; W. Milburn, "Evening on the Wear"; Miss E. M. Barrows, "Reflections."

Bronze Plaques.—C. Walker, "The North Choir Aisle, Ely Cathedral"; R. Berry, "A Study"; J. Harbottle, "The Writer"; E. T. Clark, "Staircase, Haddon Hall"; R. Barritt, "Decorative Study"; Miss H. Stevenson, "A Charity Girl."

Certificates.—W. F. Brigham, "Entering Port"; H. E. Stadden, "Rosina"; A. Nicholson, "Old Scarboro'"; S. Tymms, "A Forest Glade"; J. R. Sandilands, "A Lowland Pool"; J. R. Burden, "Through a Norman Arch"; E. W. Bush, "In Kenilworth Castle"; A. Marshall, "The End of the Day"; T. L. Hampshire, "Daffodils"; B. A. Ranes, "In Ceylon"; E. T. Oakshott, "Dignity and Impudence"; B. Jackson, "In an old Crypt"; W. W. Newbold, "A Calm September Morning"; Miss M. Bruce, "Foggy London"; Mrs. H. Morgan, "Sister Hephzibah."

Very Highly Commended.—C. D. Paton, "In Glen Spey"; J. J. Rothwell, "Thro' the Wood"; Miss E. S. Griffiths, "River Taw at Barnstaple"; S. Lister, "A Shady Pathway"; W. R. Davis, "Gorse"; A. Turner, "Winter Trees"; C. C. S. Parsons, "Hie, fetch!"; W. J. Appleby, "A Silhouette"; C. W. Armstrong, "Entrance to Cockermouth Castle"; A. G. Thistleton, "A Bit of Old Manchester"; Y. C. Hancock, "Pulpit, Holy Trinity Church, Roehampton"; F. C. Stimpson, "To the Transept, St. Alban's"; H. Bradwell, "An old doorway"; James Bradwell, "Nest of a Song Thrush"; H. W. Chapman, "Daffodils"; W. H. Andrews, "Gossip"; J. Ludlam, "November"; S. G. Kimber, "A Temple, pure and beautiful"; H. H. Thomson, "The Run Home"; T. Carlyle, "Morning in the Woods"; A. M. Beatson, "The Open Road"; E. S. Pink, "Cutting Hay"; Miss Chichester, "In the Roar of the Sea"; J. S. Brice, "Winter's Gloom"; C. L. Newland, "Fishermen"; M. Walters, "A Lancashire Farm"; W. W. Baker, "In Peterboro' Cathedral"; T. Clampit, "Up with the Evening Tide"; Miss E. Ross, "Evening Shadows."

Highly Commended.—A further list of highly commended will be published in our next number.

Print Criticisms: Awards.

D. Dunlop, "Portrait," Fig. 24; A. Cohen, "A Snowclad Wood," Fig. 31; R. Smith-Porter, "First Aid," Fig. 18. Highly commended:—S. Swinden, Miss Bruce, E. T. Robson, L. M. Swainson, S. Kirby, R. Marshall, A. E. Thwaites.

P.O.P. Competition: Awards.

Silver Plaque—S. Swinden, "The Wharfe, Bolton Woods," Fig. 25. Bronze Plaque—H. W. Chapman, "Fruit Study," Fig. 21. Certificate—W. G. Hill, "In York Minster," Fig. 28. Certificate—J. H. Saunders, "The King's Highway." Highly commended—W. J. Appleby, "Thames Jetty"; H. Light, "Whitby Market"; H. S. Prince, "Norwich Cathedral."

Important Notice.—Each purchaser of this number should find therein a new set of Hand-Camera Exposure Tables (May to September) especially compiled by the Editor. If this fails to reach you send us your name and address **clearly written** on a post-card, also names and addresses of any Hand-Camera friends, when copies shall be sent gratis and post-free.

This Coupon Expires May 31st, 1904.

THE PRACTICAL PHOTOGRAPHER. COUPON No. 16.

Prints for Criticism.

RULES.

1. Write legibly, on one side of the paper only.
2. Put your name, address, and a number on the back of each print, and enclose this coupon.
3. Do not send more than three prints with one coupon.
4. State the *Month*, *Hour*, *Light*, *Plate Speed*, *Stop*, *Exposure*, *Developer*, *Printing and Toning* process employed.
5. If prints are to be returned, a stamped and addressed label or envelope *must* be sent **with the prints.**
6. The Editor reserves the right of reproducing any print sent in for criticism.
7. Prints should be addressed :—THE EDITOR OF *The Practical Photographer* (Print Criticism), 27, PATERNOSTER ROW, LONDON, E.C.

THE PRACTICAL PHOTOGRAPHER. COUPON No. 17.

Hand-Camera Competition.

Name .....

Address .....

.....

.....

WRITE LEGIBLY.

This Coupon Expires June 30th, 1904.

Hand-Camera Competition.

A Silver and Bronze Medal and Certificates will be placed at the disposal of the Judges.

1. This competition is designed to draw attention to Hand-Camera work.
2. Prints from the negatives and not the negatives are to be sent to us.
3. The Winning Prints will not be returned. Others will be returned *if* a stamped and addressed envelope or label be sent **with the prints** and coupon in this number.
4. Competitors may submit one, two or three, but not more prints.
5. Marks will be given for pictorial as well as technical merit. Preference will be given to those subjects which show the advantage of using a Hand rather than a Stand Camera.
6. Each print must bear on the back the name and address of the competitor, and also full particulars of production.
7. The prints may be by any process, mounted or unmounted.
8. Prints may be sent in any time to reach us not later than July 1st, 1904, addressed :—

The Editor of *The Practical Photographer*,
(Hand-Camera Competition),
27, Paternoster Row, London, E.C.

"Man
goeth forth
to his
labour
until the
evening."

THE PRACTICAL PHOTOGRAPHER.

Library Series. **No. 8.**

The Pictorial Work of Frank M. Sutcliffe.

By THE EDITOR.

MR. FRANK M. SUTCLIFFE is a native of that English county which stands first in point of size if nothing else. He is an amateur in the best sense of the word, loving nature and her beauties, with every changing season, though an unkind fate has made him a professional photographer, earning his living in an out-of-the-way seaside town, "principally by copying the poor work of tenth-rate amateurs and photographing restless babies."

Coming of an artistic family—for his father and grandfather were painter-artists—he has evidently inherited the pictorial tendency. His mother, who had some French blood in her veins, thinking that there were artists enough in the family, discountenanced any school art teaching for young Frank. Nevertheless, she could not very well hinder the boy watching his father draw and design, etch and paint in every conceivable medium, not even excluding the working of enamels. Before he was six years old this youth was critical enough to express disapproval of the then somewhat rough and coarse illustrations appearing in such papers as the Illustrated London News, though John Leech's drawings in Punch, and others by

Birket Foster are still remembered as having given genuine pleasure. Music of the best kind was a feature of this art-loving household.

Now it so chanced that on the bookshelves was that once famous book by Lake Price on Photography. It was this volume which determined the future career of the subject of these jottings.

Mr. Sutcliffe has the rare art of writing a letter in the same attractive and breezy way that he talks, and in one such letter to the present writer he says, "My father suggested my trying photography. I objected strongly and pointed out that no one of our acquaintance either made pictures or money by photography. My father said that was their fault and not that of photography, and, that they might make money too if they had better studios, kept them clean and went the right way to work. Then we went to live near Ripon, where I borrowed The British Journal of Photography from the beginning and wrote out in an indexed book everything which I thought would be useful."

The above quotation aptly shows us something of the far-seeing powers of father and son, and also tells us of the sturdy mental grip of those who set themselves to do thoroughly what they undertake.

With such inherited art feeling one is not surprised to find Mr. Sutcliffe writing, "Of painters, I believe that J. F. Millet has shown me more than any others. Frank Brangwyn I consider the greatest living painter. His design and colour are both grand. David Murray and Alfred East seem to know what to say and how to say it better than most men." Among the poets his favourites are Tennyson—especially the earlier and simpler writing—Shakespeare, Burns and Byron. Wordsworth also has a warm corner in his affection. But for those who have to engage in the battle of life he doubts the worldly wisdom of too much poetry, for it tends to make them too sensitive.

Here again is another extract which photographers of all kinds should lay well to heart, for it contains teaching which is sadly needed. "Photography is the lazy man's pencil, or perhaps I should

say the busy man's pencil. It enables him to make representations of things in next to no time. The weak point of photography is that except in the hands of one who has been trained from infancy to *see*, it "draws" too much, and the eye is vexed at having to reject so much. I would say that anyone can in half an hour, with pencil or brush, get more of the spirit of a scene than one could in a month with a camera. The work of the artist is to put down what he sees for the benefit of those who have not been endowed with his gifts. Even as a record of facts a few hurried pencil lines are often better than a perfect photograph."

Turning now to technical matters, we may let our readers into one of Mr. Sutcliffe's secrets. He nearly always uses a long-focus lens and large aperture, so getting the space feeling and quiet suppression of much that is not wanted. Thus on a whole-plate his favourite tool is a 14 inch R.R. lens working at f/8 or f/11.

His favourite printing medium is platinotype, though he is a past master in carbon and silver printing in various forms. He was one of the leaders in the movement towards close framing, *i.e.*, omitting the conventional and tasteless mounts of a quarter of a century ago. Like most other really fine craftsmen he has squarely faced and recognised the limitations of photography as an art process, "in not being able to make anything more beautiful than it is. It is no use to call in retouching and sunning down, for it will not alter an ugly angular line into one of grace and beauty."

Following previous custom, we jot down a few notes on the selected examples of our artist, taking them approximately in the chronological sequence of their production.

"Man goeth forth to his Labour until the Evening." In this composition we are greatly indebted to the striking character of the sky. The man and horses are strongly relieved in silhouette against the "parting daylight." Our artist was brought in contact with the great art teacher, Ruskin, some years ago, a fact which calls to mind that teacher's

insistence on the dignity of human work. It is from the land that man has wrested the vast wealth of the world. The agriculturalist is the real Atlas upon whose human shoulders rests the existence of mankind. The student should note the wise omission of any objects likely to detract from the theme of the picture. Simplicity and strength are closely allied in the making of pictures.

"**Confidences.**"—Here again we have yet another lesson in the value of a simple composition. The background of weed-clad rocks is wisely put out of focus just enough to prevent it engaging too much attention. The balance of light and shade is admirable, and the chief contrasts kept towards the centre of the picture. The soft sunlight is well suggested by the shadows about the faces, arms, and aprons.

"**In the Sunshine Time of Life.**"—A delightful scene of child-life, bathed in bright, warm, mellow sunshine, typical of the careless light laughter-loving joyousness of youth. The student should well lay to heart the technical qualities of this picture, which teach him that bright light effects are *not* rendered by under-exposure, with its sequent hardness in the high-lights and blackness in the shadows: but that it is transparency and warm reflected light in the shadow portion, with a subtle and delicate gradation in the high-lights that gives the true atmospheric suggestion of this effect. The background of distant landscape again is kept quiet, and gives a broad mass of light and shade leaving all our interest for the figures.

"**Peace.**"—This title will naturally recall a quite different class of subject published in a recent number of this series. This only goes to show how many and various are the ways that human feelings and sentiments may present themselves to us. The artist says, "Would that all of us had this old lady's secret for looking so contented." The pose of the whole figure is quite charming, and the quiet mystery of the graduated natural background leaves nothing to be desired. This is an admirable example of distribution of light and shade,

Peace.

Fig. 3.

ALL TOGETHER—BOYS.

R C. Ryan.

together with picturesque arrangement of line. The strongest lights and shadows are properly arranged about the head.

"The End of the Furrow."—Here we have a valuable object lesson in grouping. Note how the plough seems to link together the horses and men. The gradual falling away of the distance, or "differentiation of planes" is instructively shown. The horse bearing the rider is perhaps a little unfortunate in its position relative to the spectator. The student may here learn the difference between balance and symmetry of arrangement.

"The Young Orthographer and his Grandfather."—A happily caught group of fisher folk who for the most part were content to make their own spelling until such "new fangled" things as school boards came to disturb their contentment. The three men near the centre are a little too much in a row for best effect, though natural enough in pose with hands in pockets. The woman half unconsciously seems to be wishing that she too had a couple of pockets for her hands. The reproduction does not adequately convey the harmonious distribution of light and shade in broad masses without flatness which is so well presented in the original.

"In Puris Naturalibus."—It is not given to every one to have the courage to attempt the difficult task of rendering flesh tones in *plein air*,—and to still fewer comes success. The example before us is particularly valuable in showing the falsity of other renderings, which more often than not convey the impression that we are looking upon statues of bronze rather than flesh. The stones in the right lower corner are very valuable in giving space to the foreground, and serving as a tone note in relation to the darker portions of the cobble. The posing of each figure is excellent, though one could wish that the spaces between the three figures had not been quite so nearly equal.

"The Snow-clad Uplands" takes us by "a skip and a jump" to a scene vastly different from all the others. The author says—"Taken a few years ago when we had a real blizzard. It only shows how

tame the wildest scene comes out in the camera." And yet the bleak desolation of this windswept upland in that part of the world where the Londoner said, "all their hedges are stone walls," is very suggestively rendered to those who know these lonely fells.

> Bold and bleak and bare,
> Sloping towards the sea;
> . . . . .
> The angry sky portends the coming storm,
> With shivering winds and drifting snow.

"**Whitby Harbour.**"—A delightful group of fishing craft, behind and beyond which hangs a semi-translucent veil of luminous light. The nearer vessel towards the left lower corner is the keystone of the composition, as may readily be seen if we cover it over for a moment. This picture well illustrates balance without symmetry or formality, and breadth of light and shade without monotony or flatness.

"**Day Dreams.**"—A happily chosen title for a happily caught pose and expression in apt harmony with the dream pictures of the sea monsters in the background. The decorative quality of this work cannot fail to teach the observant student the value of flowing lines and broad masses of light and shade. It is perhaps a little unfortunate that the dark object just above the head should fall so nearly in the centre of the top margin. The modelling of hands and face is particularly pleasing. The flowing lines of the hair and poise of the head are also especially graceful and pleasing.

We cannot fail to notice how wide are Mr. Sutcliffe's artistic sympathies, and with what innate and unconventional judgment he treats each subject. In viewing these several examples, we must not forget that they range over a considerable period and carry us back to the days when a good many of the recent artistic "discoveries" had already been made by himself, Gale, Robinson, Rejlander, Hill, Mrs. Cameron, and a few others whose photographic work laid the foundation stones of present day pictorial photography.

Preliminary Note by the Editor.

THE beginner may perhaps be disappointed for a moment on finding that this booklet is not a complete guide to developing, fixing, printing, toning, mounting, framing, etc., like other hand-camera manuals. We therefore hasten to explain that bromide and P.O.P. printing have been already fully dealt with in Nos. 1 and 3, and developing in No. 6 of this series. Platinotype printing will be exhaustively treated in our next number. No. 7 deals with intensification, reduction and all the other processes of after-treatment of the negative. Mounting, titling and framing are embraced in No. 4. It will now appear to the reader that, having dealt with these topics in separate volumes, we are here enabled to give *far* more space and attention to hand-camera work pure and simple than would have been possible had we attempted to make this book a general guide or introduction to photography.

Introduction to the Use of the Hand Camera.

By REV. H. MUDIE DRAPER.

IT is quite a mistake to imagine that because it is easy to use a hand camera, therefore it is easy to take successful photographs. Hand-camera work, to be satisfactory, demands considerable skill and knowledge.

Choice of Camera.

Hand cameras may be classed as follows:—(1) Magazine cameras. (2) Roll film cameras. (3) Cameras fitted with dark slides.

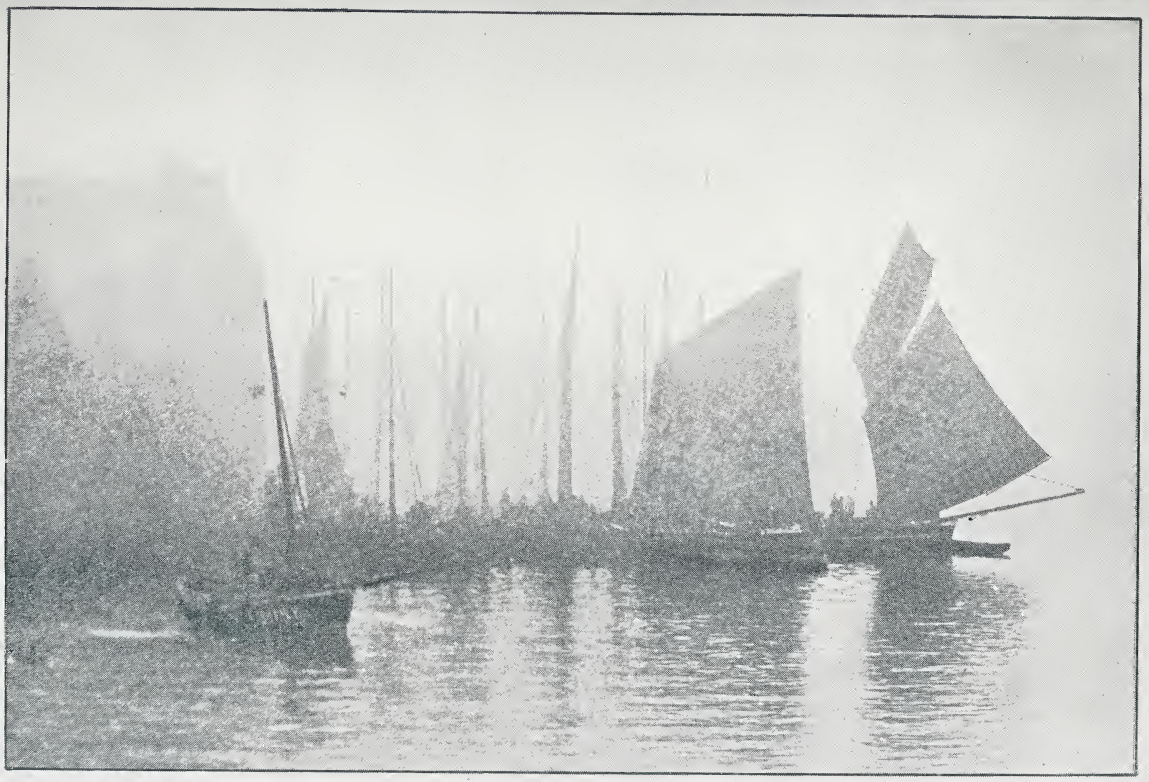
Magazine cameras are so fitted and arranged that they will contain a number of plates, which by a mechanical contrivance are removed to another part of the camera when exposed, a fresh plate coming into position when one has thus been stored away.

The great advantage of such a camera is that a number of plates may be carried within the camera, and exposed one after another with a minimum of trouble, the disadvantages being that sometimes plates refuse to change, something having gone wrong with the mechanism. There is also a liability of scratching the plates when the changing operation takes place, although both these disadvantages may be minimised with care.

Roll film cameras are fitted with two rollers turned by a key from the outside. The film being wrapped on one, is unwound from this and wound upon the other roller, after exposure has been made, a figure appearing through a little red window at the back of the camera showing when the fresh portion of film is in correct position. Of all the methods of changing films or plates this is the simplest. It is certain in its action, and the films taking up but little room the camera can consequently be made much smaller and more portable. By the use of a roll of black paper which forms a kind of support to the film, a spool of films which has been exposed may be removed from the camera in daylight and a new spool inserted without recourse to the dark-room. The chief disadvantage is that development of roll films is a much more difficult operation than the development of plates.

Many hand cameras are fitted with dark slides in which the plates or cut films are carried. They are a little bulky to carry, and the changing cannot be done so expeditiously as by the above methods, but they are open to none of the objections described above, and plates of varying speeds may be carried to suit the exigencies of the case.

Magazine and roll film cameras are not usually fitted with a ground-glass screen at the back. Some method is therefore necessary to ascertain the position of the picture on the plate. This is done by the use of view finders fitted in the front of the camera. They are usually about an inch square, and give on a small scale a picture of the view upon the plate. In some cameras a focussing screen is so fitted that a full-sized image may be seen right up to the moment of exposure. By an ingenious



mechanism the focussing screen closes up when the shutter is released.

Some hand cameras have a "fixed focus," *i.e.*, all images beyond a certain distance are in focus. In others a focussing arrangement is attached, distances being indicated by a scale and pointer fixed on the outside of the camera. The disadvantage of the former is that no object nearer than the fixed distance can be photographed, the disadvantage of the latter is the difficulty of judging distances correctly. Both these disadvantages are eliminated by the use of a camera with full-sized finder as above described.

Films v. Plates. The great advantage of using films is to be found in their lightness and portability. Four dozen films weigh less than a dozen plates, and take up no more room. Moreover they can be printed from either side, a great advantage in carbon work. They are, however, much more expensive than plates, and are not so easy to develop.

The chief disadvantage of plates is their weight, but they require less skill in development, therefore the percentage of successful photographs is much larger if they be employed.

The Lens. The cheaper hand cameras are fitted with single lenses, those more expensive with R.R. lenses. A single lens is no use where buildings are to be taken, as it does not render straight lines correctly. A single lens is to be preferred for landscape and portraiture. Spend your money on the lens and get the best lens your pocket can afford. It is quite easy to be misled by a showy instrument got up for sale, containing a very indifferent lens. Test the lens before purchasing a camera. To do this, open the shutter, take out the plate carriers, and insert a piece of ground glass the same size as plate. Cover your head and back of camera with focussing cloth. Your picture will then be projected on the ground glass, and the definition and covering power of lens seen at a glance. Note at the same time if the view in the finder is identical with the view on the ground glass.

Selecting a Camera. (1) See if the focussing scale be true; this is often faulty with cheap cameras fitted with a focussing scale. The way to test this is to mark off along the pavement distances from the camera as given on focussing scale. Insert the ground glass in the camera, as above described; set the scale to the nearest distance, and note if the objects at a similar distance on the pavement are in focus; do this with all distances marked. If all are in focus, the scale is correct; if not it needs to be re-marked.

(2) Carefully test plate-changing arrangement if the camera be of the magazine variety. It is annoying to get a plate jammed when far away from a dark-room. Load up the camera with used plates of right size, then carefully change each one; do this several times and see if the mechanism acts rightly. One plate at a time should drop and no more. (Advisable to do this occasionally before using camera to test if the mechanism is still in order).

(3) Plates are often fogged because the camera is not light-tight. To test—close the lens, open the back, take out plates and carriers. Throw the focussing cloth over the head and camera; hold the camera up to strong light for some seconds. If any stray light is coming in it will be apparent.

Fittings to Hand Camera. (1) Shutter.—Usually hand-camera shutters are too fast, hence under-exposed plates; $\frac{1}{20}$th of a second is quite fast enough for all ordinary work. If plates are under-exposed take means of slowing the shutter.

(2) Level.—Sometimes one and sometimes two levels are supplied. These are very convenient adjuncts to hand cameras. (Annoying to find on development that the picture is spoiled because the camera was not held level).

(3) Some of the better class of hand cameras are fitted with a rising front. This is a great advantage, as it enables one to get in the tops of buildings without tilting the camera, which is fatal to perpendicularity, unless a swing back be provided, which is rare in hand cameras.

Never attempt to take a time exposure with the camera held in the hand. The result is nearly always failure.

Thoroughly master all the workings of your instrument before you take it out to photograph. Try all the working parts and make yourself absolutely familiar with them before you expose a plate. An hour spent indoors with your camera will save much time and trouble afterwards.

Loading.—If yours be a magazine camera, this operation is most important. Plates jamming are more often caused through careless loading than through defect in mechanism. Put in each plate separately, and carefully notice if the first is in its correct position. Dust all plates before putting them into the camera; dust also back and front of carriers, and occasionally dust out the interior of camera. Carry the camera carefully, avoid swinging it about, and avoid jars, or dust will settle on the plates, and a plentiful crop of pinholes on the negatives will be the result.

In the Field. (1) Never point the camera directly towards the sun, or the result will be that you will get a "flare spot" on your negative, and it will be spoiled. The image of the sun should never be seen in the view finder; if this be remembered, pleasing effects may often be obtained by working against the light. Most of the so-called "moonlight effects" are obtained in this way.

(2) It is not often advisable to have the sun directly at the back, so often recommended to hand camera workers, the result will be a flat picture lacking light and shade.

(3) The best position for all-round work is to have the sun either on the right hand or the left, then light and shade will be delineated, and these go so much towards making a successful picture.

Holding the Camera. The amateur will probably discover for himself how best he can accomplish this. The usual method is to press the camera against the chest, and do not breathe while the shutter is being opened. I sometimes tuck the camera under my left arm.

(1) It must be held perfectly steady, the slightest jar will be fatal. Although you can take a snapshot of an express train at full speed without showing any movement, yet the slightest *movement of the camera* will spoil the photograph.

(2) The height at which the camera should be held will vary with the object you are about to portray. A good height for most subjects is from 3 feet to 4 feet from the ground. If too high, an undue proportion will be given to the foreground; if too low nothing but foreground will be obtained.

(3) Press the button, pull the string, or move the lever of the shutter gently. Don't strain it or jerk it, or you will blur the image. This is especially to be remembered when the shutter is working at a slow speed.

(4) Hold the camera upright and level, the "level" will help you to do this. On some finders vertical and horizontal lines are ruled, and are useful. See that buildings, etc., are upright. Nothing looks worse than a lopsided building. Do not tilt the camera unless it be provided with a swing back. If tilted upwards, buildings, etc., will appear to be falling backwards, if downwards they will appear to be toppling forwards. This fault is often seen in hand camera photographs.

Composing the Picture. The laws of composition are not to be despised even by hand camera workers. Aim at making *pictures*, and not mere reproductions of scenes. Even if you merely take photographs as mementoes this should apply. The majority of hand-camera workers one sees at holiday resorts know nothing of composition, hence the unsatisfactory nature of their prints.

Noblesse oblige. Remember that most people are endowed with feelings. Do not therefore give offence to anyone with your camera. There are a lot of blackguards armed with hand cameras who have brought photography into disrepute by snap-shotting in people's faces, much to their annoyance, and much to the detriment of serious workers.

The young Orthographer and his Grandfather.

Fig. 6. R. C. Ryan.

AN EIGHT FEET JUMP.

Fig. 7. R. C. Ryan.

LOOPING THE LOOP.

Hints on Hand-Camera Work.

By JOHN R. SMITH.

HILE it is undoubtedly possible for a really intelligent person accustomed to accurate and careful work in other directions to take a camera, and, remembering perhaps half a dozen definite rules, to produce, with the assistance of trade development, a reasonable proportion of satisfactory negatives, the *best* work can only be done when the worker understands the various photographic operations, and is able to adjust such factors as speed of plate, aperture of lens, speed of shutter and strength of light together. Some study of the direction and quality of light is necessary. The light at noon is very different from the light at seven in the morning even in summer. The direction from which the light reaches the subject is also important—the more shadow the more exposure required. A fair grasp of the variations in the actinic power of the light is of first importance.

Table of Light Values.

For this a table of light values is very useful, and perhaps more satisfactory than an actinometer. A plate of fair rapidity should be used and kept to, so that one factor at least may be constant. The principle of the stops of the lens must be grasped. With modern lenses the only function of the stop is to increase depth of definition. A good anastigmat will cover sharply at open aperture, but distant and near objects will not be defined with equal clearness.

Depth of Definition.

If the object to be focussed sharply is only five yards away, it is most probable that sharp focus will only exist in objects five yards to eight or ten yards away, and, of course, as the distance beyond the five yards increases the definition will *gradually* deteriorate in quality. But the shorter the focus

of the lens the greater depth of definition it possesses. Hence it must be understood that, as nearer objects are focussed the distance will become indistinct unless the aperture of the lens is reduced. A little practice will enable the necessary stops to be determined.

Effect of Stops. As a rule, in English lenses each succeeding smaller aperture necessitates the exposure being doubled, hence the speed of the shutter must be slowed as the lens is stopped down. Thus $\frac{1}{50}$ sec. at $f/8$ must be reduced to $\frac{1}{25}$ sec. at $f/11$ and to $\frac{1}{12}$ sec. at $f/16$. Below $f/16$ it is not necessary to go in ordinary work, and it will be found that $f/8$ and $f/11$ will be the stops most generally employed.

A Knowledge of the Instrument in Use. By this I mean a practical acquaintance with the camera employed. An expert photographer may be quite at sea with a strange instrument until he has grasped its special features. In hand-camera work the alterations have to be made often at a moment's notice and with great promptness, or the opportunity of securing the picture is gone. If the worker forgets to slow the shutter when he puts in a smaller stop, or if he cannot find the speed adjustment instantly, failure ensues. The man who knows his apparatus well can work it almost without looking at it.

Self-control. Doing the right thing at the right moment depends almost as much on knowing yourself as on knowing your camera. Any vacillation is fatal. Success in hand-camera work depends on being able to see the subject, to almost automatically decide on the stop necessary and the exposure required, and to be ready to make the exposure exactly at the right moment, while being all the while prepared to say "*No*" to the ever-present question, "Is it worth a plate?" A subject may alter materially for the worse or the better after it has caught the eye. The plate-spoiler makes his exposure and, after spending time in development, throws the negative away; the worker who can control himself stays his hand and saves his plate if the subject is not worth it.

Apparatus. The work the hand camera does is so varied that the instrument is more or less a compromise. For general work the requirements are few and simple. The lens should be a good rectilinear or aplanat, or, better, a modern anastigmat.

Shutter. The shutter should be simple, so as not to readily get out of order or be affected by changes of temperature, and the more readily the speeds can be set and read the better. The "roller blind" and the "between-lens" shutters are the two best-known types. The former gives greater efficiency, and the speeds are more likely to remain fairly accurate; the latter is adapted to give slower speeds, which are very useful, and is rather easier to manage when changing speeds, but is apt to be deranged by dust or grit getting into the mechanism. The speeds, too, are not always accurate, and when the shutter is set for $\frac{1}{100}$ sec. it may be working at $\frac{1}{20}$ sec.

Efficiency. The efficiency is not great—that is, when set for any speed, say $\frac{1}{25}$ sec., the shutter is not fully open for quite half that time, so that the exposure is shorter in reality than it is supposed to be. All shutters (except the focal-plane) take an appreciable time to open and close, but the "roller blind" allows more light to pass during exposure than the other type. There are cameras on the market with special shutters fitted with speed adjustments consisting of pneumatic brakes. These adjustments are rapidly set and very reliable; but, of course, such cameras are not the cheapest.

Focal-Plane Shutter. The focal-plane shutter, of course, gives the greatest efficiency, and, practically speaking, twice the light reaches the plate for a given exposure when this type is used. There is no reason why it should not be fitted on cameras for ordinary work. It can be made to work as slowly as $\frac{1}{10}$ sec., but to avoid distortion slow speeds must be obtained by widening the slit, rather than by moving a narrower slit more slowly across the plate.

Fixed Focus and its Disadvantages. A camera may be with or without focussing adjustment. If the lens is set for infinity, or, more usually, a trifle further from the plate than the infinity focus, objects will be in focus with a 6-inch lens at *f*/6 from 50 feet distant and beyond, at *f*/8,30 feet distant and beyond, and at *f*/11,27 feet and beyond. If a 5-inch lens is employed (though this is rather too short a focus for satisfactory perspective), then the distances become 35 feet, 26 feet and 19 feet respectively. It will thus be seen that if a camera has no focussing arrangement, objects nearer than 19 feet (with a 5-inch lens) cannot be obtained sharply defined, even when *f*/11 is used. In order to get sharp pictures of nearer objects three courses may be adopted.

Magnifiers. The lens may have a supplementary lens fitted in front of it which will slightly shorten its focus and so give a sharp image of any near object. These supplementary lenses are in reality "eyeglasses" for the camera, and are usually known as *magnifiers*. The rule determining their selection is, that if an object 10 feet away is required sharp, the magnifier used must have a focal length of 10 feet, and so on. Three magnifiers are usually sufficient, enabling objects at say, 14 feet, 10 feet and 6 feet, to be focussed sharply. If copying or flower studies are done, then perhaps others may be needed. It may be well to observe that this rule for deciding the focal length of "magnifiers" is only correct when the lens of the camera is set for "infinity," but the slight difference in position, *viz.*, for an object, say, 50 feet away, will not make any serious difference to the use of the magnifiers in every-day work.

Focussing Adjustment in the Lens. The lens itself may provide the focussing adjustment. That is, the lens may be so constructed that by varying the separation of the glasses its focal length is altered. The Cooke lens and the Ross' Homocentric may be so made, and will then focus from three yards to infinity by a rotating adjustment of the front glass.

The end of the furrow.

Fig. 9. L. H. West.

CARRYING A CAMERA.

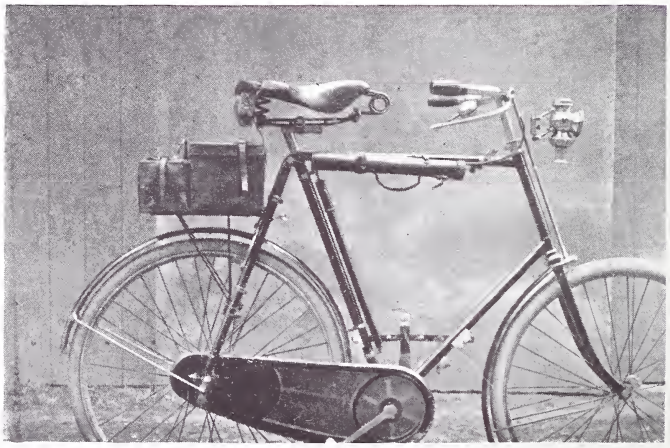


Fig. 10. L. H. West.

CYCLE AND CAMERA.

Focussing Jacket. Another method, of course, is the well-known one of mounting any lens in a focussing mount. The iris diaphragm is worked by the rotation of a ring on the front of the lens, and the spiral focussing arrangement is operated by a second ring behind the iris, with a scale of distances engraved. The spiral slot causes the lens to move backward or forward in its jacket.

Rigidity. With either of these methods there is the great advantage that the camera may be rigidly constructed and perfect parallelism obtained and maintained between the front board and the plate. The axis of the lens is thus always at right angles to the plate, and the best is obtained from the extremely delicate modern anastigmats.

Rack. Another method of focussing is the ordinary one seen in stand cameras, *viz.*, that of adjusting the distance between the front board carrying the lens, and the plate, employing a lever, a worm screw, or a rack and pinion to effect the movement.

Swing Back. A hand camera proper need not be fitted with a swing back. It is not needed for the great majority of hand-camera shots, and if serious architectural work is to be done, a hand stand camera, such as one of the folding types, had better be carried and used as a stand camera, which it really is. A very important

Rising Fronts. movement however is the rising front. This should be available for both upright and horizontal views and should give a movement of at least a quarter of the length or width of the plate. The advantages secured are that excess of foreground can be cut off, and very often the top of a building or of trees may be included without tilting the camera.

Finders and Levels. Two finders and two levels are almost essential for accurate work. Slow moving circular levels answer every purpose, and as they only cost 1/- each they may easily be fitted after a camera has been purchased. They enable any buildings to be secured with vertical perpendiculars and in other cases

ensure horizontal horizons. Note the difference between inclusion of buildings and serious architectural work.

Plate Changing. The method of plate changing demands careful consideration. Plates may be used in a magazine changer, in which the exposed plate is dropped into a well, or they may be carried in sheaths and a bag changer, or dark slides may be used. For serious work the automatic changer is rather risky as the plates are more or less loose and liable to stir up dust. The great merit is that changing is rapid, occupying only about a second, and another plate is at once available. Bag changing takes longer, say 5 to 10 seconds. It is more compact and plates do not rattle about. Dark slides are most bulky of all and take longest to change, but they are more sure.

Bag Changer.

A Home-made Hand-Camera of Great Efficiency. It has been suggested that if workers bought a focal-plane shutter and a lens, fixing the shutter at one end of a box and the lens at the focal distance at the other end, and using dark slides in the grooves with which the F.P. shutter is provided, all the essentials of a hand-camera would be available. There is no doubt the lens and shutter are the most important matters, and such a suggestion is useful, but only as the germ of an idea. I would modify it by saying, have the shutter square so as to turn like a reversing back, have the lens either with focussing front glass or in focussing jacket, and have a rising front one way, *i.e.*, vertically. Such a camera would be compact, and with one level and one finder would answer for all general hand-camera work and for a good deal of special work as well. It is, in fact, difficult to say what it would not do except that it could not be used with lenses of long focus. The lens might be outside on the actual front of the camera but it would be better to have an inner front and a circular hole in the actual front so that the lens is protected from damage.

Specialised Work.—It is quite possible that for certain kinds of work special features may be required in a camera. The inclusion of these will

render it more effective for that particular type of work, but in all probability less effective for other work. I will briefly indicate some special requirements.

Pictorial Work.—Larger finders are an advantage, enabling the view to be better seen and composed. A camera of the reflex type, showing a full-sized image, is good from this point of view. The camera may have long extension, so that long-focus lenses, or a single combination of a convertible anastigmat or a telephoto lens may be used. All these features tend to increase bulk and weight. Dark slides may be used so that a variety of plates may be carried—for instance, both ordinary and orthocromatic. If a lens of fairly wide aperture, say *f*6, be used, exposures of $\frac{1}{10}$ of a second may readily be given with ortho plates and a light filter.

Figure Studies.—A wide aperture lens is necessary for work in narrow streets or courts and for working in a poor light. The camera generally must be unobtrusive. Rapid changing is an advantage, as groupings of figures are constantly varying. The Geddis mirror, fitted in front of the lens so that the camera is pointing in another direction, tends to prevent figures appearing self-conscious, as they do not know they are being photographed.

Waves and Seaside Work.—A camera such as I have suggested, with F.P. shutter at one end and lens at the other, but the dark slide must be closed in with a door and a piece of patent plate glass over the hole on the front, and the whole covered in waterproof material to exclude (if possible), the sea water.

Architectural Work.—In hand camera proper, lens of fairly short focus and ample rise to front. Better to use hand-stand type on a stand, and have the advantages of a stand camera. A hand camera is only a makeshift for serious architectural work.

Special High-Speed Work. — Such as sports, animals, express trains, yachts, etc., etc. A wide aperture anastigmat *f*/5·6, is essential, so as to be prepared for emergencies, poor light, or extremely short exposures. A focal-plane shutter is essential, and the most rapid plates obtainable. For some

work, such as express trains, the place the train will occupy may be focussed for, and the plate inserted, the exposure being made when the train reaches the position. For sports, animals, and so on, it is an advantage to have a camera of the reflector type (fitted of course with focal-plane shutter), so that the moving object may be followed, the exposure being made when it is in a suitable position.

"Stand" Development.* For development in batches, "stand" development may be adopted, employing a very dilute developer in a grooved tank, development taking several hours, the plates being covered up and examined from time to time. Or 6 or 8 plates may be developed in a flat dish in the ordinary way, having in readiness two smaller dishes containing in one case a developer with a maximum of alkali, and in the other case very little alkali, but a preponderance of bromide and pyro or any other developing agent which is being employed. Any plate lagging behind is promptly placed in the dish containing the developer strong in alkali. A plate appearing over-exposed may be placed in the other dish, and in the stronger developer will more readily gain density.

Developing Brief Exposures. For developing abnormally short exposures, a powerful developer such as metol is desirable, if not essential. The developer should be made up without bromide. Development will probably take some time, I have spent nearly an hour developing very brief exposures. If the detail appears to be well out it may be useful to add either pyro or hydrokinone to aid in the building up of printing density and the developer should be so made up that this addition may be readily made, the metol being in one solution and the pyro or hydrokinone being in another.

It must not be assumed, however, that a *rapid* exposure, such as say 1/500 sec., will of necessity demand special treatment. With best June light, most rapid plate, lens at *f*/5·6 and fairly open subject a fully exposed plate may be obtained in 1/500 sec.

* Vide *The Practical Photographer*, No. 6, "Developing and Developers," p. 60.

High Speed Shutter Photography.

By R. CHAPPELL RYAN.

THE hand camera is essentially the instrument for this class of work. Before attempting such work the beginner should be fairly proficient in the use of a hand camera for the average subject with the ordinary shutter working at 1/5 to 1/100 of a second. The photography of rapidly moving objects must be regarded as one of its extreme uses, but to the ambitious it will afford a fascinating and absorbing branch, will develop faculties for observation, and bring out every bit of originality the worker possesses.

The Shutter.—A hand camera to which is fitted a focal-plane shutter with speeds ranging from 1/200 to 1/1000 of a second is a *sine qua non*. Preference should be given to the type giving slow speeds in addition; also one that will open to the full width of the plate for time exposures. The lens must be of good quality and have an intensity, or working aperture of not less than F/6·5, and preferably a lens of F/4, or F/5, should be selected.

The Plate.—The plate must be of the highest degree of sensitiveness coupled with good quality, fresh from the makers, and of the same brand the worker is in the habit of using.

The Camera.—The beginner will doubtless choose the ¼-plate size. Considering its initial cost, light weight, and the possibilities of some failures, this size is to be recommended. The writer, however, prefers a larger plate for the following reasons:—a wider angle may be utilised to afford more scope for the after-treatment of the picture, as one does not always succeed in getting the principal object in exactly the desired position; the larger size also gives the option of making presentable contact prints.

Development.—Where negatives are made with the idea of enlarging the smaller plates may be employed, a soft thin negative should be aimed at and a developer used that will produce a negative of a neutral black colour, such as metol, rodinal, metol and hydroquinone. All of these are suitable for developing plates that have received very short exposures. For the larger plates use the following:—

A.—Pyro, 60 grs.; metol, 45 grs.; potass. metabisulphite, 120 grs.; potass. bromide, 20 grs.; water, 20 ozs.
B.—Soda carbonate, 4 ozs.; water, 16 ozs.
Use equal parts of A. and B.

This is very energetic and will bring out all possible detail with plenty of contrast, the colour of the negative, however, is not so suitable for enlarging by artificial light unless of exceptional brilliancy.

All developers should be diluted with an equal volume of water and used at a temperature of 65 degrees Fahr., winter and summer.

Exposure.—The distance at which an object is taken should be based upon its size, rate of movement, and due regard to the safety of the operator. It is never advisable to try and cover the whole of the plate with a single figure, or group of two figures. The nearer the object and the shorter the exposure required. This increases the risk of movement showing and also of under-exposure. The middle distance on the focussing scale of the principal object is always easy to judge, will be found convenient for nearly all subjects and is a useful standard for the beginner, with the additional advantage that the background is nearly always out of focus, giving more value to the principal object. It is obvious that a brilliant light is essential to obtaining a fully exposed negative with such brief exposures of 1/250, 1/500, 1/800, up to 1/1000 part of a second, and the tyro may accept the speed indicator of all first-class focal-plane shutters as being approximately correct. Do not be discouraged by the sudden fluctuation of the light, especially in the summer time. There is a wide range of subjects from which one can choose, *e.g.*, children at play, girls skipping, etc., are nearly always to be found. There is little likelihood of the charge of imitation on account of the variation in the models.

Railway trains, motor cars, horse-racing pictures are also obtainable in most places, while the seaside in the summer time will provide an endless variety of diving, water polo and yacht races.

In the case of trains, smoke and steam are of great value in showing motion, and wherever possible a background should be chosen to give sufficient contrast; a curve in the rails is much more pleasing than a straight line. Motors should show a good trail of dust in the rear, and the selection of the background coupled with a bend in the road is desirable.

View Point.—It is hardly ever advisable to photograph an object quite broadside on. Show a portion of the front, and one side, wherever possible. As a general rule the lighted side is preferable.

Though the light is at its maximum from eleven till one, it is not always advisable to confine oneself to working during this period, the angle at which the light falls at 10 a.m. and 3 p.m. gives, in my opinion, a much better result.

Undoubtedly the crux of the subject lies in the ability of the operator to judge the right moment for the exposure and the subsequent careful development of the plate. Avoid as much as possible all semblance of "flurry." Devote special attention to the order of preparing the camera. The stop will be first selected. Our choice being based on the condition of the light and exposure suitable for the subject. As a rough guide the reader may refer to figs. 3, 6 and 7. In conclusion let me advise the photographer to aim at originality in his subject, the rendering of motion, atmosphere, good composition, balance, and strict attention to the details of development. Remember to give as much, and not as little exposure as the subject will permit. A subject that could be taken perfectly sharp with a lens of 5 in. focus on a quarter-plate, with an exposure of say 1/500 sec., with a longer focus lens of say 10 inches under the same conditions would show movement, giving less depth of focus, and the possible semblance of under-exposure at the same aperture.

Hints to Hand-Camera Workers.

By S. O. MAW.

HOLD the camera firmly in the left hand, and, if a long exposure is to be given, press it against the body, or rest it on the knee, while the right hand is used as an additional support, so placed that the thumb or first finger is in a convenient position to "press the button."

Avoid Shaking the Camera, and never risk giving more than $\frac{1}{8}$ sec. exposure without setting up the tripod or steadying the camera on some equally convenient object, as nine times out of ten the camera would be shaken and the picture spoilt.

Simplicity.—Simplicity should be one's aim in making a truly pictorial landscape. The introduction of figures is seldom an improvement, though, if it is desired to suggest life and movement, a few village children will add much to the charm of a rural landscape; but even then avoid overcrowding, which leads to scattered interest, confusion and weakness.

Backgrounds.—Always take care that the background for a figure is not a blank sky, in which case the tone-rendering of the face will be unnaturally dark, even though the sun be behind the camera. Place your figure a short distance from some dark object; choose a quiet, unobtrusive background. If it is wished to give the figure greater prominence the former may be slightly out of focus. A figured screen or a speckly, flowering shrub would be the worst possible backgrounds to choose, as they would annoy the eye and detract very much from the importance of the face.

Position of Figures.—If the subject is posed with bent head or takes a stooping attitude, be sure space is allowed in the picture for head or figure to raise themselves erect in one's imagination, otherwise, however elegant the pose, the beholder will surely complain of stiff neck or back-ache after a few moments' gaze!

CONFIDENCES

Some Optical Matters concerning Hand-Camera Work.

By C. WELBORNE PIPER.

WHEN an object plane at a certain distance from the camera is in sharp focus all planes at other distances are, strictly speaking, out of focus; but, practically, that fact will not be apparent in the case of objects situated within certain limits of the one plane in true focus. These limits bound what is called "depth of field"; the nearest plane in apparent focus being the limit of near depth and the farthest plane that appears to be sharp being the limit of far depth.

Depth.

The shorter the focal length of the lens and the smaller its aperture the greater its depth, and as a hand-camera lens is of necessity of large aperture it must be of short focal length to secure much depth.

With cameras that have no focussing adjustment (fixed focus cameras) it is important to secure a maximum amount of depth, and to do this the lens must be fixed so as to bring into sharp focus a distance equal to *one hundred times the square of the focal length of the lens divided by the f number of the stop.* This is called the hyperfocal distance (or depth constant) of the lens for that particular stop, and when we focus upon this distance all objects beyond half the distance are in focus. Thus, with a 5 in. lens and *f*/8, the hyperfocal distance is 2,500 ins. divided by 8, or 26 ft., and by focussing sharply on 26 ft. all objects beyond 13 ft. are brought into focus. If we focus on a greater distance the nearest point in focus will be farther from the camera, and if we focus on a nearer distance very distant objects will be out of focus.

Knowing the depth constant we can easily calculate near and far limits of depth when focussing on any particular near distance with the same aperture.

To find the distance of the nearest object in focus

multiply the distance in sharp focus by the constant and divide by the sum of distance and constant.

To find the distance of the farthest object in focus *multiply the distance in sharp focus by the constant and divide by the difference between distance and constant.*

For example: The constant for a 5 in. lens with stop *f*/8 is 26 ft., therefore, when focussing on 10 ft. the near limit of depth is 260 ft. divided by 36, or about 7¼ ft., while the far limit is 260 ft. divided by 16, or 16¼ ft. All objects from 7½ ft. to 16¼ ft. from the camera are therefore in focus.

Excepting with very perfectly corrected lenses the rules given only apply to objects represented in or near the centre of the plate. All distances are supposed to be measured from the front principal focus of the lens.

Focussing Scales. A focussing scale can be marked by trial in the camera for certain short distances, or for infinity, but generally the marks for long distances have to be calculated. The following two rules are most easily applied.

The relative distances from the infinity mark to any two other marks on the scale are always inversely proportional to the distances represented by those two marks. Thus if one mark on the scale is known to represent 10ft., another mark twice as far from the infinity mark represents 5 ft., and one only half as far from the infinity mark represents 20 ft. When the infinity mark and one other mark have been found by trial, other marks can be set out by the above rule. It is sometimes more convenient, however, to directly mark the scale for a particular distance, and this is easily done by the following rule.

The scale distance between the infinity mark and any other mark representing a particular distance is always equal to the square of the focal length divided by the distance of the object in inches. Thus with a 5 in. lens the space between the infinity mark and one representing 5 ft. is 25 in. divided by 60, or $\frac{5}{12}$ in.

The distances shown should not be selected haphazard, and the best series is the following. The first mark from the infinity mark should show the hyperfocal distance with the stop most often

used (see Depth), and the succeeding marks should in turn be 1/2, 1/3, 1/4, 1/5 etc., of the hyperfocal distance. Thus, with a 5 in. lens and *f*/8 stop the complete series should be Infinity, 26′, 13′, 8′-8″, 6′-6″, 5′-3″. These marks will all be equal distances apart, their separation being always equal to $\frac{1}{100}$ in. multiplied by the *f* number of the stop, or to ·08 in. in the example.

This series of distances represents consecutive depths; which means that if we focus on any one distance with the stop allowed for, the two adjoining marks show the respective distances of the nearest and farthest objects in focus. In the assumed case if we focus with *f*/8 on 13 ft. depth extends from 8′-8″ to 26′. If we halve the aperture depth is shown two divisions away from the distance in sharp focus, so that when focussing with *f*/16 on 13 ft. depth extends from 6′-6″ to infinity.

Lenses. Although the fine quality lenses now obtainable have been for the most part designed especially for hand-camera work it does not follow that the most rapid and expensive types are always desirable. They are really only necessary for very special work, and not a few photographers waste money on lenses that are far too good and even unsuitable for their requirements. With any of the ordinary types of shutter working at the lens, an aperture larger than *f*/8 is very seldom required, and, excepting when the camera has a rising front, the lens need not sharply cover a space larger than a quarter-plate. Hence moderate priced lenses of the rectilinear or aplanat type will often fulfil all requirements very satisfactorily. An anastigmat will give critically finer definition over a larger plate, and is therefore a very desirable lens when a rising front is used, but it is not necessary for its aperture to be over *f*/8 for ordinary work. With exposures under one-hundredth of a second on rapidly moving objects an aperture of *f*/6 or *f*/6·5 is desirable, and lenses with this rapidity may be obtained of the rectilinear, aplanat, or euryscope types. Few of those lenses will, however, cover a quarter-plate to the margins with such large apertures and it is much better to procure an anastigmat. Even with a

focal-plane shutter it is not necessary to use larger apertures than *f*/6, excepting in very special circumstances, and lenses of about *f*/4 are only required for extremely rapid motion in a bad light and for indoor work. Such lenses are useful sometimes, but it is generally best to reserve them for special occasions, as they have no advantages when stopped down to ordinarily useful apertures.

The excessive covering power or width of angle possessed by some of the highest quality lenses is undesirable for pure hand-camera work, as the small plate only utilises a portion of the light and the rest is reflected from the sides of the camera and fogs the plate.

Single lenses are often used in cheap hand cameras and if of good quality they will do very useful work, though they can never be rapid enough for very brief exposures. As a general rule they will not cover a quarter-plate well at an aperture over *f*/11, and it may be as well to warn photographers that not a few of the *f*/8 single lenses fitted in cheap cameras are really *f*/11, the number having been altered to deceive the purchaser.

The telephoto lens of ordinary type is not generally fast enough for very quick exposures and the special type known as the Adon is practically the only kind suitable.

Shutters. A good shutter should be of high efficiency, by which we mean that the full aperture of the lens should be wide open during the greater part of the time of exposure.

The highest efficiency is possessed by the focal-plane shutter, which is a blind with a narrow slit moving across and close to the plate. This is the only type of shutter suitable for very brief exposures from 1/100 to 1/1000 sec. The speed is adjusted in two ways, by altering the width of the slit and modifying the speed of the movement. As different parts of the image are exposed in succession a certain amount of distortion is introduced if the object is in rapid motion, and to avoid the effect of this as much as possible you should not at any time use a smaller slit than is absolutely necessary.

IN PURIS NATURALIBUS.

Fig. 14. F. C. L.

YCUTH AND AGE.

Fig. 15. F. C. L.

THE VILLAGE INN.

Shutters fitted to the lens are of much lower efficiency than focal-plane shutters, but the most efficient types are those that open first and close last in the centre of the lens aperture.

With any type of shutter that works close to the diaphragm efficiency is greater with a small stop than with a big one, so that halving the aperture sometimes only reduces the exposure to $\frac{3}{8}$ instead of $\frac{1}{4}$. With shutters fixed behind or in front of the lens efficiency does not vary with the stop, but in the former position a shutter is, as a rule, rather more efficient than in the latter one.

When the exposure is made by an aperture in a blind or metal plate crossing the lens the efficiency is lowest when a circular aperture is used. The edges of the aperture should be straight if the shutter is fitted outside the lens and convex if it is at the diaphragm slot. In all cases the shutter aperture should be at least as large as the space it has to uncover. If smaller, their efficiency is seriously impaired, while the image will very likely show uneven illumination.

The Rising Front in Hand-Camera Photography.

By C. J. DAVIES.

NOW that many hand cameras have rising fronts, difficulty is often experienced in guessing to what extent this adjustment should be employed. The following method has proved useful in practice:—

Procure a circular plumb indicator (Fig.32) and graduate the edge in eighths of an inch. Attach it correctly to the side of the camera, and focus on some high building. The camera must now be tilted until the plumb indicator has swung through one division, and the amount of view noted on the focussing screen. Level the camera and obtain the same amount of

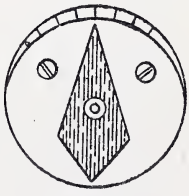


Fig. 32.

view by use of the rising front, and make a mark indicating the amount of rise employed. A similar mark on the front may be made for each division on the plumb indicator, and the latter may be graduated to show either rise or fall.

To use the indicator, point the camera at the object and tilt until the amount required is visible on the finder, then note the position of the plumb indicator and set the rising front in accordance with it. The camera must now be held level and the exposure made.

This indicator is indispensable on an ordinary roll-film camera, and will be found a useful adjunct to any camera when used from the hand.

The Hand Camera amid Sports and Pastimes.

By LEONARD H. WEST, LL.D.

THOUGH the photography of sports and pastimes may not be a very exalted branch of photography, it nevertheless has a double interest—(1) in the portrayal of typical British amusements, and (2) to the actual participants in the particular game or sport and to their friends.

Difficulties. It is, however, subject to certain special difficulties: (*a*) *We cannot always choose our own time for securing the photograph;* it is often a case of now or never, and at the moment conditions (*e.g.*, light) may be unfavourable.

To make a photograph effective as a portrayal of a sport or pastime it must catch some characteristic or point of interest. A photograph of a tennis match, showing four players standing inactive in the four courts, would have no point. It should show the striker in the act of serving, or a player taking a return; the same principle applies to any other game or sport.

(*b*) Again, *rapidly moving objects will in the majority of cases have to be dealt with, e.g.*, horses or hounds in hunting, racing, shooting, a cast or landing the fish, the running or jumping athlete, the bowler and batsman in cricket, etc.

(*c*) *In many cases defective light will be a great difficulty.* Two of the most attractive sports, hunting and shooting, are in season when the light is the least actinic during the year, and the same applies to football, hockey and other pastimes. These difficulties may be best met by :

I. Suitable Apparatus. The camera should be one which is quickly available and readily operated. This almost necessarily excludes anything but a hand camera. The box type with fixed focus has advantages. If not "fixed focus" there should be a readily adjustable scale. Where one has to act in the field, and on the spur of the moment, it will probably be found by most hand-camera users that it is much easier to correctly judge one distance from your object (perhaps 18 feet, of course readily ascertainable) within which you must never trespass, than to correctly judge varying distances from 5 to 50 feet and adjust the pointer on your scale accordingly.

Again the shutter must be capable of being quickly set and quickly released. For some sports bulb and tube would be very much in the way.

A good view-finder must be relied on, preferably the full-sized view of the "Reflex" type, if cost of camera is not a consideration.

2. *Rapidity of plates or films.* One would naturally select a rapid rather than an ordinary plate. If other objections do not overcome the gain in rapidity and fine definition, plates are to be preferred to films.

Shooting. But for some purposes, *e.g.*, if used in the shooting field by one who is also carrying a gun, and must not on any account keep his companions waiting, a roll film can generally be more quickly changed than plates.

Moreover, for the "rough and tumble" of some sports, *e.g.*, fox-hunting in the Lake District, the chances are that plates may suffer seriously from breakage.

(3) A third means of assistance against the difficulties above referred to will be *a lens working at a large aperture*, say *F* 6·5 and *the most effective shutter*, (which is, of course, the focal plane) if available, with the camera selected.

Hunting. *The modes of carrying the camera.* If hunting and on horseback, a camera of the "folding pocket" type can be carried in the pocket, or may be strapped from the shoulder. Any other form may mean injury to the rider in case of a fall. If hunting on foot, a box camera slung by strap over the shoulder, will be carried easily and safely.

This mode of carrying will also best serve the shooting man, who wishes to obtain photographs of actual incidents of the field and at the same time participate in the sport himself. One of the accompanying illustrations, (Fig 9) shows a box camera attached by a strap passing over the left shoulder, and resting on the hip. In this way the camera never interferes with the use of the gun, is ready for use at a moment's notice, the photographs taken, and the film changed without keeping the other guns waiting. A cover can easily be improvised to protect the camera against injury from showers.

Cycling is a pastime, to which Photography is an excellent supplement, and here, of course, something beyond hand camera work alone may be readily undertaken. With a carrier attached to the rear of the bicycle, the photographer can secure for himself a very complete outfit,—the accompanying figure 10 shows a box containing a combined 4 x 5 hand and stand camera, and four dark slides, focussing cloth, and case of supplementary lenses, while the small box behind it is a box camera for snap-shot work, where there is no time for the adjustment which the larger camera would involve. The tripod is attached to the top bar of the frame, and the bicycle lamp with the circular face makes an excellent dark-room lamp for changing plates and film when touring, if a piece of red fabric which you can carry in a pocket-book, is trapped into the face.

IN THE SUNSHINE TIME OF LIFE.

Boating is another pastime which gives scope for hand-camera work, and probably of a more pictorial character than possible in most forms of such work,—the strong light of sea, and (to a less extent) river scenes, allowing of short exposures, and sky, water, reflections and boats, giving many possibilities.

In most cases of Sports and pastimes it is desirable to *get as near the object as possible*, otherwise the objects will appear almost insignificant.

On the other hand, where it is possible to get near the object, bear in mind the considerations as to focus already referred to, and do not get so near as to throw the object out of focus, or if using the scale, be careful not to misjudge your distances.

Lastly, remember that in photographing sports or pastimes, they come first, and the photography second, and *don't interfere with the players, or break the rules of the sport.* For instance, do not get in the way of hounds which have checked, and are trying to work out the line of the fox on a cold scenting day, or you may hear from the Huntsman some opinions on photography you will not appreciate!

Moving Objects: A Note for H.-C. Workers.

By A. G. WORKMAN.

HAND-CAMERA workers are chiefly interested in moving objects, *e.g.*, trains, sailing boats, waves, animals, human beings. Successful negative making will therefore depend upon so adjusting the shutter as to give time enough for plenty of exposure without showing serious movement of the object. The hand-camera man may conveniently divide all movements into two kinds. First, objects moving towards or away from him, *i.e.*, along the line of sight or axis of the lens; as, for example, a railway train entering or leaving a station as seen from the platform edge, or from a railway arch crossing a straight bit of line. Second, objects

moving across the line of sight; as, for instance, a train seen "broadside on" from a field, or street traffic as seen from the pavement when looking straight across the street, or water falling down a cascade, etc. Of course, it seldom happens that we have to deal with objects which move exactly along the line of sight, but generally we can say whether the direction is nearer the first or second class of movement. The difference is important, as the accompanying diagrams will show. Take the case of a train, and suppose the heavy line A to represent the face of the engine moving across the line of sight. Fix attention on, say, one of the buffers, represented by the small circle at A, Fig. 33. On the ground glass or plate of the camera A would be represented by *a*. Now suppose that in one second of time A moves to B. This on the plate corresponds to a movement of the image from *a* to *b* of *a b* be more than 1-100th inch on the negative it will show as a blur on the print.

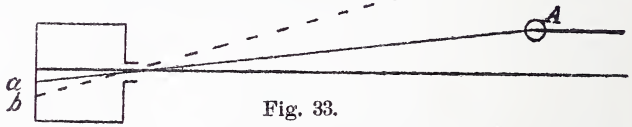


Fig. 33.

Now let us change our position, so that we see the engine front coming straight towards us, *i.e.*, along the line of sight, as in Fig. 34. Here C represents the buffer, which in one second of time moves to D, and during this time the image moves from *c* to *d* on the plate. It is very easy to see that the movement *c d* is much less than the movement *a b*, so that the shutter speeds required in the two cases are obviously different.

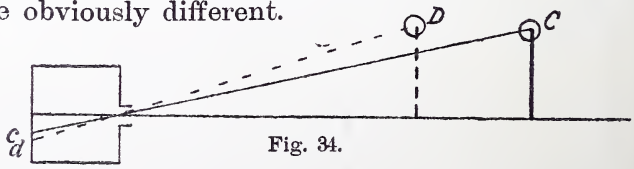


Fig. 34.

Instead of C moving to D, we may imagine it moving to F or to G, Fig. 35, for instance; but so long as D, F and G are in a straight line with the lens the *position* of the image in all three cases

would be the same, *viz.*, *d*. But there is also the size of the moving objects to consider, for objects moving towards the lens, as from C to D, give us an increasing size of image as well as a change of position. Similarly objects moving away from us, as from C to G, give a reducing size of image. It is only when they keep the same distance from the lens, as when moving from C to F, that they retain the same size on the plate, Figs. 35, 36.

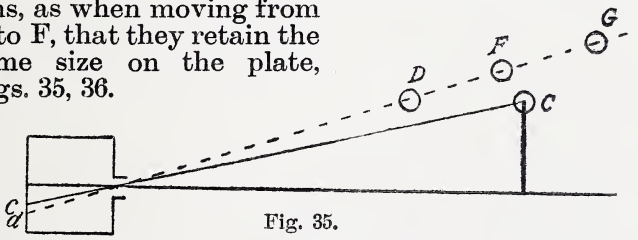


Fig. 35.

One other matter must be noticed, *viz.*, the distance betwen the lens and ground glass or plate. This in turn depends upon two things, *viz.*, the focal length of the lens and the distance of the object.

Increasing the focal length of the lens increases the distance between the lens and plate, Fig. 36, increases the size of the object, and increases the displacement of the image. Thus the displacement *c d* with a short-focus lens becomes *e f* with a longer-focus lens. Roughly we may say that the displacement is proportional to the focal length employed. Suppose we are using a 5-inch lens and *c d* is just 1-100th inch. (This is the practical limit of movement allowable.) Changing this lens for an 8-inch lens our displacement, *e.g.*, Fig. 36, would be 8-5ths × 1-100th, or say 1-63rd inch—an amount that would show a blurred image in the print.

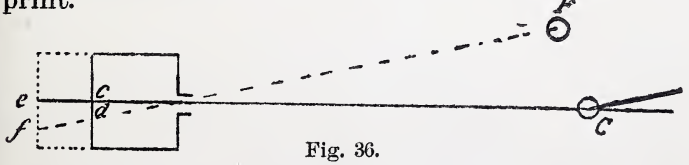


Fig. 36.

Again, if we go nearer to our object we have to increase the distance between the lens and plate, which brings us to the same state of affairs as though we had retained the same standpoint and used a longer-power lens.

Clearly there is no time to make elaborate calculations just before a shutter exposure is to be given. We must therefore be prepared beforehand with some such table of moving objects as that given below, and take it as our guide until the fruits of experiment or experience show that it can be dispensed with.

A Table showing the Slowest Shutter Speeds available so that the image of a moving object may not be displaced more than $\frac{1}{100}$ inch with a lens of 5-inch equivalent focus :—

Rate of moving object.		Examples (see below).	Distance of moving object from lens.		
Feet per sec.	Miles per hour.		Quatr. mile. Secs.	1000 yds. Secs.	100 feet. Secs.
1	$\frac{2}{3}$	Loitering	3	$\frac{3}{8}$	$\frac{1}{8}$
2	$1\frac{1}{2}$	Strolling	$1\frac{1}{2}$	$\frac{1}{4}$	$\frac{1}{10}$
3	2	Children walking	1	$\frac{1}{5}$	$\frac{1}{15}$
4	$2\frac{2}{3}$	Adults walking	$\frac{2}{3}$	$\frac{1}{6}$	$\frac{1}{20}$
5	$3\frac{2}{5}$	Children playing	$\frac{1}{2}$	$\frac{1}{8}$	$\frac{1}{25}$
10	7	Football, cricket, etc.	$\frac{1}{3}$	$\frac{1}{18}$	$\frac{1}{50}$
22	15	Trotting horse, cycle	$\frac{1}{7}$	$\frac{1}{40}$	$\frac{1}{100}$
44	30	Galloping horse, motor	$\frac{1}{15}$	$\frac{1}{75}$	$\frac{1}{250}$
88	60	Express train	$\frac{1}{30}$	$\frac{1}{150}$	$\frac{1}{400}$
100	68	Flying birds	$\frac{1}{50}$	$\frac{1}{250}$	$\frac{1}{750}$
1000	680	Projectiles	$\frac{1}{350}$	$\frac{1}{0\ 1\ 0}$	$\frac{1}{5000}$

The figures are to be taken as convenient approximations.

Loitering crowds; people standing about a market-place, etc., cattle grazing, etc. Strolling, *i.e.*, slowly walking, dawdling about, cows walking slowly, sheep grazing. Children walking quietly, horses or oxen ploughing. Adults walking at an ordinary speed of three miles an hour, children playing such games as marbles, rounders. Adults playing cricket, tennis, football, rackets, etc. Trotting horse, cycling, slow train, waves. Galloping horse, men racing, motor cars, trains, waves. Express train at full speed.

It will, of course, be understood that the above shutter-times are the minima or slowest available speeds for normal conditions; but there are obviously many conditions which have wide variations. Consider a game of cricket. We may have

THE

SNOW

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the moment of changing an "over," men strolling, or a return after a blank stroke, or the players rushing for a "tight fit." Again, we may have men running at a comparatively slow speed in a mile race, or sprinting for 100 yards.

Turning again to Figs. 33-36, a moment's consideration will show us that when the direction of the moving object is such that it does not change size, *i.e.*, keeps the same distance from the lens, it has the greatest displacement on the ground glass. Thus had C moved in the direction of F for a distance equal to CD or CG, then F would be considerably beyond the line DFG. This is shown in Fig. 33, where the image displacement CD is considerably greater than in Fig. 34.

In the above table the calculations have been based on the assumption that the image is moving across the line of sight, *i.e.*, as in Fig. 33. This may be taken as practically equivalent to the maximum displacement, except when the object is near the camera.

It almost goes without saying that where negatives are being made for the purpose of enlarging we must take extra care about adjusting the speed of the shutter, so that when the enlarged image is made the enlarged blur may not exceed say 1-50th inch. The reason why we may allow a greater blur in an enlargement is simply that small contact prints are usually examined at a normal distance from the eye, say 12 inches, while enlargements, *e.g.*, 20×16 or more, are generally viewed at say 3 feet or so, and at this greater distance a 1-50th inch blue would not be more noticeable than 1-100th inch blur seen at 10 or 12 inches from the eye.

Similarly, if the negatives are for lantern slide making, we must bear in mind the size of the picture on the screen and the average distance of the spectators, then make allowance for the permissible blur, bearing in mind the nature of the subject. For instance, a greater amount of blur would be permitted in the case of splashing waves than in the case of a skipping rope. In the former case we look for general movement; in the latter we only look for movement of one thing.

The Manipulation of Films.

By A. M. CLARKE.

SEEING that so many films are now-a-days used by hand-camera workers, it has been suggested to the present writer that a chapter of practical hints on the manipulation of films would be acceptable to those workers who have hitherto confined their attention to glass plates. This chapter, then, is for those who have had no previous experience with films.

Why Use Films?

First: They take up very much less room. In travelling this is a very material advantage. A dozen flat films do not occupy more space than two or three glass plates. *Second:* They are *much* lighter in weight; another great gain to the traveller, especially if a cyclist or pedestrian. To the climber this is a feature of special advantage. *Third:* They are practically unbreakable. A package of films may be tossed from one end of the room to the other with little risk of damage. This can hardly be said to be the case with a box of glass plates. Films may thus be sent through the post if rolled on a spool or packed between a couple of sheets of card. *Fourth:* They can easily be retouched on either side. This gives them an advantage in the hands of the capable pictorialist. *Fifth:* Being so much thinner than glass, there is correspondingly less light scattering by reflection, *i.e.*, less halation. *Sixth:* Also this thinness enables them to be printed either way round with practically no loss of definition. This is a gain in the matter of cloud printing; also in the carbon single-transfer process, which requires a reversed negative to give a non-reversed positive. *Seventh:* In the majority of cameras arranged to take roll films the used spool may be removed and a new one put in without recourse to a dark-room for changing. In the case of certain cut films this system of daylight changing is also applicable. It is only fair to say that

there are also certain "changing boxes," which enable one to change glass plates without retiring to a dark-room. *Eighth:* Films being flexible is not an unmixed blessing. The flexibility is a convenience in rolling, in combination printing, and at times useful in other ways; but this flexibility means a tendency to curl during developing, fixing, etc., and this curling involves special precautions and care, which are not needed with glass plates. *Ninth:* This is a "con." rather than a "pro," *viz.*, the consideration of cost, for films are more costly than glass plates. *Tenth:* This is an open question, *viz.*, the keeping property of films or plates. Opinions vary very widely on this point, the general tendency going to show that it is undesirable to keep films longer than necessary, though they have been kept in good condition for long periods, but that care should be taken to guard them from heat and damp.

Films are of two kinds, *viz.*, rolled or spooled and cut or flat. Various film-holders are on the market for holding cut films, so that they may be manipulated more easily during development, etc., but these film-holders are a luxury rather than a necessity.

Developing Roll Films. We may commence by developing an exposed roll of a dozen negatives. Two courses are open to us—either to develop all twelve exposures as one long strip, or cut up the roll into single pictures. In the former case we may buy various forms of rotating machines, so that by turning a handle the whole length of the film passes through a trough of developing solution; or we may seize each end of the strip in one hand and, with a see-saw up-and-down motion of the two hands, pass the film through a dish of developer. It has been suggested that one end of the film be held in a clip to which is attached a string passing over a pulley in the ceiling, and carrying a small weight at the other end of the string. The other end of the film is either held by the fingers or a clip and pulled to and fro, while the other hand guides the film emulsion side downwards through a trough of fluid; or, if it be desired not to put the fingers in the fluid,

certain porcelain bridge-like arrangements may be bought. The film easily slides under the bridge, and may be moved to and fro without fear, as the back of the film only touches the bridge. This strip method of developing a dozen negatives at a time seldom finds favour with the careful worker, who naturally prefers to treat each negative on its individual merits or interests, and be free to modify its treatment without similarly manipulating other exposures. In short, the strip method may be called the lazy man's process.

The Obvious Alternative is to cut up the film and develop each exposure separately. This brings us to the starting-point with cut or flat films, except for the difference that roll films when cut up are troublesomely curly. To meet this we may employ some of the various forms of film-holders, or, what is by some regarded as preferable, *viz.*, give a good long preliminary soaking in cold water to the cut-up pieces.

Caution. When cutting up films the beginner is advised to use a pair of scissors with long narrow blades. If they are long enough to reach right across the width of the roll, so much the better. Frequently one or both the end pieces of the film are somewhat longer than those in the middle. Care must be taken to cut the film exactly opposite the markings on the black paper. It is a good plan when cutting up a spool to have at hand a good deep card-box, or a chip-box such as the hatter uses for sending out tall silk hats. The film and black paper are cut through from side to side at one operation, the paper and film together falling into the box. It is then easy to sort out the papers. For soaking use a large deep vessel, *e.g.*, an earthenware foot-bath, large basin or dish. With one hand take a film from the box and with the other hand put it in the water and turn it over and over two or three times, removing any clinging air-bells. Do not let the film rest against the bottom or sides of the vessel for at least a minute after immersion, and then only let the non-film side touch the vessel. Do not let two films be in contact. If the vessel be deep enough and the films

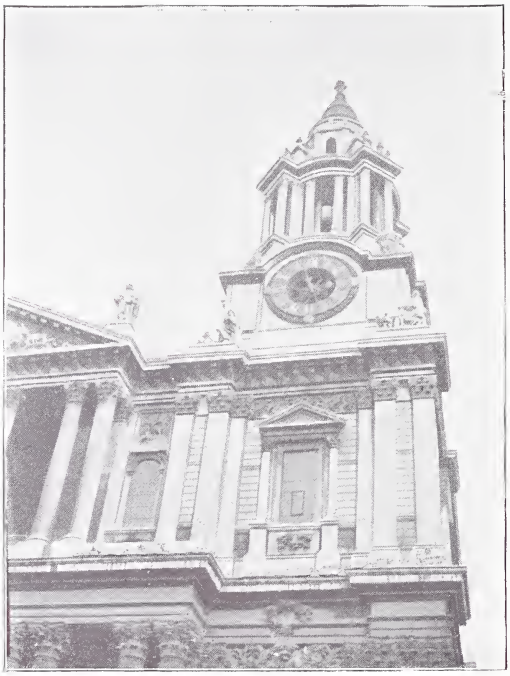


Fig. 20. F. C. L.

S. W. TOWER.

Fig. 19. F. C. L.

ST. PAUL'S, WEST FRONT.

put in carefully, they may be made to stand on edge all the way round the vessel if it has upright sides. For small-size films up to quarter-plate we may use a row of glass or earthen jam jars.

Development. There is only need for two matters of caution to be given to the worker who hitherto has confined his attention to glass plates. In some cases ammonia, caustic alkali, or acetone may not be used. Therefore, if the maker gives no word of caution on this point, it will be well to make one or two trials with these reagents upon test exposures before running any risk with exposures which may be difficult or impossible to repeat in case of harm done by the developer. Again, the glass-plate worker who has been accustomed to employ perhaps 1½ oz. of solution for a quarter-plate had better begin with *at least 4 ozs.* and a deep dish. A few trials will probably show him that, in order to keep all the film well covered with solution, he will want it to a depth of an inch or more.

To Develop a Curly Film. Lay the previously soaked film face up in the dish. Pour on the developer to a depth of, say, 1½ inches, give a swirl round, then turn the film face down so that it rests on its edges, forming an arch or bridge. The finger or a glass rod touching the back will prevent this arch rising out of the fluid, if only the dish and quantity of developer be reasonably adjusted to the case.

Avoid holding a warm finger against the film back or front, as the locally applied heat will probably accelerate development and cause a patch. Some workers prefer to employ slow development with single films. Half a dozen common twopenny tumblers with straight upstanding edges are used. In each tumbler is put a cut film (uncoated side against the glass), and is herein given a half-hour's soaking. The water is then poured away and a dilute developer poured in to a depth to well cover the film standing on the edge. One well-known worker so adjusts the strength of his developer that each film takes half an hour to develop. Each film is started five minutes after the last, so that in an hour twelve exposures are developed.

These five minutes' intervals give time to transfer from the developer and rinse under the tap for a couple of minutes the developed sections, and transfer them to the fixing bath, while others are slowly developing. An occasional swirl round during development is all that is needed. A shade is fixed over the dark-room lamp, so that the films developing are almost in darkness.

Scratching. It must not be forgotten that we are dealing with a gelatine surface, which is easily scratched or torn. Therefore some care must be taken to avoid the sharp corner of one film from scratching or injuring the gelatine coating of another film. This caution, of course, applies to all the operators of developing, fixing, etc.

Frilling in a similar way may be started by one film edge rubbing another film edge,—or may be induced by handling the films with hot, warm fingers. It may also be brought about by transferring a film from a solution at one temperature, *e.g.*, tepid developer, to another at a markedly different temperature, *e.g.*, recently mixed, and icy cold fixing bath, etc. A developer too strong in alkali may also induce frilling.

Fixing. Here, again, the same precautions must be taken to ensure the whole of the film being well covered by the fixing bath. The film must be moved about, and turned over frequently. Care must be taken to prevent them from overlapping each other.

Washing, of course, must be thorough. It is better to wash in half a dozen changes of five minutes' duration in each bath, than to soak in slowly changing water for two or three hours.

The tumbler or jampot method may be applied to fixing and washing, just as in developing. But a more convenient method for washing is to use a couple of wooden buckets. The strips of film are cut up singly or into lengths not quite so long as the bucket is deep. Two strips are taken and put back-to-back, a pin is passed through the corner of a pair of strips and then into the edge of a small block of wood. Another pair is similarly attached to the

opposite end of the block of wood. Similarly the two sides. We have then eight strips hanging more or less vertically downwards and upheld in the water, by the floating block. While the films are thus soaking in one bucket, the other one is being filled with clean water. The wood block is then carefully lifted out of one bucket, and equally carefully lowered into the clean water,—the second bucket. The first is now emptied, and clean water put in, ready to receive the washing films at the end of five minutes. Between each transfer it is well to let the film strips drip and drain for a minute or so.

Drying. The tyro must not attempt to use alcohol or methylated spirit to hasten drying, in the way often done with glass plates, or he will probably find that the celluloid basis of his film has been more or less dissolved by the spirit, and the film irretrievably ruined.

Cut Flat Films may be dried by pinning one corner to the edge of a wooden shelf. Cut roll films are best dried by pinning all four corners down to a piece of thin board over which has been previously laid a sheet of blotting paper. The boards are then set up on edge in a dust-free, airy place. The films should be placed on the board so that one corner is lower than the others. If an edge of a film be horizontal when set up to dry the water will collect along this edge, dry very slowly, and may leave a drying mark. If a film be wanted quickly it may be surface-dried by momentarily pressing it between two sheets of fluffless blotting paper and then dried by fanning.

To Prevent Curling. It has been frequently suggested that the last washing water should contain one part glycerine in twenty parts water. This plan is open to the objection that a trace of glycerine is left in the gelatine film, and as glycerine is a hygroscopic or moisture-attracting substance the film is never really dry. This may induce stains and spots with silver paper or platinotype, may bring about silver spots in the negative itself, and will tend to encourage the growth of fungi and micro-organisms generally.

To Distinguish the Coated Side. If the film is held in such a position as to catch the reflection or glint of the dark-room light, it will be noticed that the coated side looks dull and gives a burr'd light, while the non-coated side is shiny and gives a much brighter, sharper reflection. Moreover with flat cut films there is nearly always a slight tendency to curl inwards on the coated side, as this side is slightly concave. This is more noticeable at the edges.

DEVELOPERS FOR FILMS.

1. A. Water, 20 ozs.; soda sulphite, 2 ozs.; pyro., 3 drms.
   B. Water, 20 ozs.; soda carbonate, 1 oz.; potass. carbonate, 3 drms.; soda sulphite, 1 oz. For use take equal parts of A and B.
2. Water, 20 ozs.; soda sulphite, ½ oz.; potass. bromide, 3 grs.; soda hydrate (caustic), 25 grs.; pyrocatechin, 45 grs.
3. Water, 20 ozs.: soda sulphite, 1 oz.; soda carbonate, 1 oz.; kachin, 80 grs.

The above are my three favourite formulæ for film development. It is convenient to note that all three have a factor of 10. The reader is referred to No. 6 of the *Practical Photographer* for complete and practical instructions as to factorial development, which certainly is very convenient for film manipulation.

Developing Roll Films.

By C. J. DAVIES.

PROCURE a round baking tin five inches deep by seven in diameter, and coat the inside with black varnish.

Developer.—Fill this tank with a very dilute developer to a depth slightly exceeding the breadth of the film. A suitable formula is: Water, 10 oz.; metol, 2 grs.; soda carbonate, 13 grs.; soda sulphite, 22 grs.; potassium bromide, ¾-gr.

Remove the film from the backing paper, and after dividing it at the perforations into two lengths of six exposures each, place one of these lengths in water until flaccid, and then transfer to the

Fig. 22. F. C. L.

THE ONION SELLER.

Fig. 23. F. C. L.

IN THE MARKET.

developer, so that the film rests on its edge in a loosely-rolled condition. The outer end of the film should be attached to the side of the tank by a a wooden clip, and a round glass bottle suitably weighted may now be revolved along the face of the film until it has reached the centre of the helix, when a reverse motion is given to it.

If the film is removed, cut up, and placed in water as soon as the divisions between the various negatives are visible, the tank should be capable of dealing with three rolls of one dozen exposures each before exhaustion.

Development is, of course, completed in a flat dish with any developer of normal strength. This method avoids streaks of extra density and minute striæ, which are so often present in films that have been drawn through the developer.

By squeezing a strip of glazier's lead on to one edge of a roll film, it may be coiled into a regular helix, and will then develop evenly without further attention. The developer must in this case be well diluted and one not liable to staining.

Miscellaneous Hand-Camera Hints.

By F. C. LAMBERT.

STALKING, in the hand-camera man's vocabulary, means just neither more nor less than avoiding observation of himself by his victims. There can be no question about it being of the first importance to do this if natural, realistic, and unconscious expressions, poses and groupings are to be obtained.

First of all the worker must keep cool and quiet. Must not be fussy about forcing his way among a crowd to get to the best place or front row. He can get there just as soon by a little quiet patience. Next he must not be seen to be "fiddling about" with his camera, changing the plate, trying the shutter, altering the stop. When these things are necessary, the worker should do them without looking at his camera, or should slip aside under cover of a doorway or side street, behind a boat or rock or tree.

It is most essential that he knows his instrument so well that he can manipulate any part or movement without looking at the camera, and indeed sometimes this must be done while the camera is held behind one's back, or under one's coat.

A good stalker must learn to make up his mind quickly, and as quickly carry out a pre-arranged intention. For example, you espy a group of children playing in the street. Do not stop and look at them and then see how they come in the finder, or they will surely espy you, cease playing, and begin to take the keenest interest in the "photography man," and ask him to "take my picture, mister." Better to walk slowly on—and pass the group, making up one's mind the point of view where the shot will be taken, size of stop, speed of shutter, etc. Directly you have passed your group, your arrangements should be made, then turn round, bring the camera into position, and take your picture before they have had time to know they are being operated upon. Having passed them they are little likely to take an interest in a back view of yourself. A second shot may be taken by reversing the direction of your walk, passing them again and making the exposure from the side which first caught your attention.

At another time you may be loitering about in, say, a market place, quay side, or street corner, and have observed a good bit of composition which only needs a figure at a certain point to give balance, contrast, relief, emphasis, interest, etc. In that case you may make all your arrangements and just stroll about looking at the boats, the clouds, your watch, read a newspaper, take a feigned interest in a group that you are *not* going to include in your position, but all the time keeping half an eye on the place where the desired figure is to occupy. It may happen that everyone around you has discovered you have a camera and are waiting for an opportunity. This will perhaps interest them so much that what you look at they at once fix attention on. In that case a little guile may come in useful. Having selected your real view point and subject, then pretend your interest is in a direction at right angles, or perhaps just

opposite to the real direction of your subject. With that peculiar instinct which makes people desire to be included in a picture (which it is a million to one that they will never see), you will thus be able to draw away undesirables from your selected scene. (This dodge is especially useful with children and women folk.) Then, when they are as they think nicely placed in your picture, you can quickly turn your camera round, and get your subject before they have realised that they are *not* the chief object of your pictorial desires.

Sometimes one can dodge a group of figures by turning one's back upon them, and hold the reversed camera under one's arm, and rely entirely on the finder. A companion is often useful in stalking, as he can stroll up and talk to one group in which you can pretend to take an interest, until a happy moment arrives when you make the exposure on some other group that you have quietly been watching all the time. The beginner will wisely rely a good deal on the finder to tell him *how much* subject is included, and also *when* it is correctly included on the plate. But with observation and practice one may learn to know how much subject is included, and also learn to know by *feel*, not sight, when the camera is being correctly held so as to include this amount of view.

Successful stalking means patience and practice. It means good humour to take and give inoffensive chaff. It means tact in knowing what to say to one's subject so as to disarm suspicion. It means a measure of self-control not to get excited or "flustered" because the right figure will not come along, or because the wrong folk will persist in hanging about where they are not wanted.

Judging Distances.—This is an art which may be acquired by practice. When out walking select an object—pause and guess how many *yards* it is from you—then pace it and verify your guess. But before doing this measure out a 10-yard distance and test your paces. Few people step quite the full yard. Probably you will find then that a true 10 yards length takes 11 of your full strides. Then bear in mind that your paces are about 10 per cent. short of true distance. Practise guessing distances

under various conditions, *e.g.*, along and across the street. Distances along a narrow street look longer than they do along a wide one. Similarly a 10-yard length along a grass field or lawn or other even ground does not look so far as the same distance cut up by shrubs, beds, etc., in a garden. Distances over water look shorter than the same distances over land.

It is well to fix upon some standard distance (corresponding to your lens and usual stop) within which you must not trespass unless you re-adjust your stop and focussing scale. For instance, say that you chiefly devote yourself to landscape work with a 5½-inch focus lens and stop *f*/11. If your focussing scale be set at 23 feet then all objects from 11½ feet to infinity will be sufficiently sharp for practical purposes. Thus 12 feet is your trespass distance for this stop at this focus. If you are using *f*/8 with the same lens then your focussing scale should be set at 32 feet, and half this distance, *viz.*, 16 feet, is your trespass distance within which you must not go without re-adjusting the scale or stop, or perhaps both.

The beginner is advised to set his scale to 20 feet, and use *f*/8 as his standard. This gives him a range of focus for objects not nearer than 11 feet, and not beyond 87 feet with lens of 5-in. focus.

Another very useful aid in learning to judge distances is to get an adult friend of average height, to stand at 4 yards, 6 yards, 8 yards, etc., and to note how tall—how large he appears on the finder at those distances. This bit of knowledge not only enables one to verify one's guesses at distance, but has the additional help of keeping the sizes of figures in suitable proportions to the picture space.

Verifying the Limits of the Finder.—It is important to see that the amount of view shown on the finder fairly closely corresponds with that taken on the plate. To compare these two, first remove all sheaths or plate holders, and substitute a piece of fine ground glass, taking care that it occupies the position of the film or plate when an exposure is made. Now set the camera on a table opposite an open window showing some distant

PORTRAIT—
STUDY

objects—arrange the camera so that a distant object, *e.g.*, a tall chimney, just falls on the edge of the ground grass when the focussing scale is set for distance. Then, without moving the camera, see if this same object corresponds with the margin of the finder. Similarly the other side of the view. Then turn the camera on its side and verify the other two sides of the plate. If the finder shows too much view, a little black varnish must be applied with a fine brush to cover up the excess of view. Next as to near objects. To get these in focus we must rack out the lens, *i.e.*, increase the distance between the lens and ground glass. Set the focussing scale for the nearest object so marked. Now transfer the scene of operations to a room, and use the flame of a lighted candle as your object. We now arrange for the image of the flame to fall on the margins of the ground glass. Increasing the distance between lens and ground glass has reduced the view angle. Consequently when the image of the flame is sharply defined on the ground glass it will fall within the margin of the finder. Again using the fine pointed brush and black varnish, we indicate by one or two tiny dots the reduced picture angle for nearest objects on the finder. All four sides are corrected in the same way. It will not be necessary to mark the intermediate positions of the lens.

Holding the Camera.—The position of the camera relative to the objects, *e.g.*, ground, etc., may make just all the difference between a good and a bad composition. That, however, is a topic more properly belonging to the subject of selection, arrangement and composition, rather than a booklet on Hand-camera work, and is accordingly reserved for that subject.

Briefly a low-down view point compresses the ground planes, and gives more importance to foreground objects. Thus, with a low view-point, reeds, long grass, or shrubs in the foreground may be given suitable importance.

A high-up view-point tends to spread out the foreground, and gives a looking-down-upon kind of effect which is seldom quite satisfactory from the pictorial aspect.

Hence we find painters sit rather than stand to their work. But to every rule an exception, and at times the hand-camera man has to take up exceptional positions. For example, in a crowd it may be necessary to hold the camera well up over one's head, turning the camera upside down so that the finder is on the lower side. Again, one may have to look over a hedge or wall, or some other object or obstruction, when the camera may be held level with the face and a sighting shot taken by looking along the edge of the camera itself if of box form. Or it may be held just under the chin with its lower edge resting on the chest. In this case a wire frame finder is desirable. This may easily be fitted to a box form of camera by any one who can use a pair of pliers. This is diagrammatically shown in Fig. 37, where A is a rectangular piece of wire corresponding in shape and proportions to those of the plate in use. Two small flat pieces of brass screwed to the top of the camera enable this wire rectangle to be folded down flat when not in use. Similarly, a hinged wire loop at B is so arranged that the sighting hole is opposite the centre of the rectangle. This is marked by two fine black threads joining opposite corners and crossing each other. The eye placed opposite the sighting hole of B is directed towards the crossing of the threads, when the wire frame outlines the view.

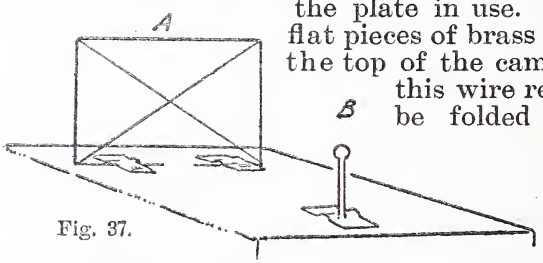


Fig. 37.

To determine the proper size of A proceed as follows: Suppose the camera is for $\frac{1}{4}$-plate (say 4×3) with a 5-inch lens, and it is desired to use a wire frame of 3 inches for longer side. Draw CDEF (Fig. 38) the size of the plate in use. Join CE, mark off CK equal to the long side of the wire frame desired. Draw KH parallel to DE, and HG parallel to EF. Then GHKC is the actual size of wire frame required. Next, to determine how far this frame must be from the sighting hole to give the proper view angle. Draw LN (Fig. 39) the focal length

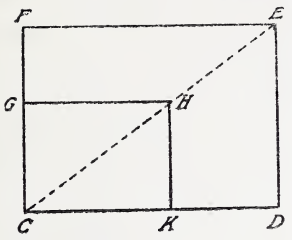


Fig. 38.

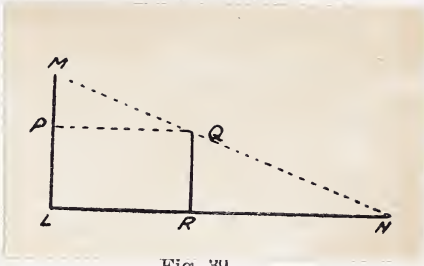


Fig. 39.

of the lens. Draw LM equal to the short side of the plate, *i.e.*, DE, and perpendicular to LN. Join MN. Mark off LP equal to HK. Draw PQ parallel to LN, and QR parallel to ML. Then RN is the distance between the sighting hole A and the frame B.

The next position to hold the camera is at the length of one's arms when they rest against the body, when the finder can then be conveniently seen. Some workers prefer to pass the right arm round the camera, and have the left hand underneath the camera. The exposing trigger may then be touched by either hand as may be most convenient. If a lower position is desired then bend the knees, resting the body on the front half of the feet and rest the camera on one knee. A still lower position—sometimes useful when working on the edge of a quay side—may be got by holding the camera between the knees—using the two hands, one on each side of the camera.

Some cameras are provided with buttons or studs which engage in holes in a leather strap which passes over the neck of the worker, and suspends the camera at a convenient height for operations.

Opinions are practically unanimous in saying that the moment to fire off the shutter is either at the beginning or end of a respiration, *i.e.*, when the lungs or inflated or deflated, "full or empty." Not a few failures due to moving the camera during exposure are the result of *suddenly* pushing the camera when the exposing button is being released.

What is wanted is not a sudden push, but a gentle and quick squeeze. Thus, if the first finger is used for the trigger, then the second finger should be below the camera and the thumb at the side, and these two should grasp the camera firmly so that the first finger is quite free to move while the other two are helping to hold the camera steady. It is a great help to lean the body against any solid object, such as a lamp post, railing, tree, gate, wall, rock, boat, etc., at the moment of exposure. To acquire a steady hand the beginner should practise releasing the shutter, trying to see how gently, not how quickly, he can do it. The beginner will probably not be able to hold the camera quite still for an exposure longer than $\frac{1}{16}$ second. But with practice it can be held quite still for $\frac{1}{4}$ second when the conditions are favourable.

On a windy day it is desirable to have one's coat tightly buttoned up, or the wind may easily get enough grip to give a movement to the body. A flapping overcoat or cape is a great nuisance in windy weather on this account.

Some workers stoutly affirm that it is easier to hold the camera still by holding it free of, *i.e.*, not touching any part of the body except the hands. Their method is usually to firmly plant the feet same 12 or 15 inches apart, and hold the camera with one hand at each side of it with the arms stiffly held a few inches away from the body.

In a rough and ready sort of way one may say that the further we are from our subject the higher the camera may be held. Thus, for objects, figures, groups, 10 or 15 feet away, the camera should be about level with one's waist—for 15 to 30 feet chest high, and for distant objects chin height will generally be acceptable. This is, however, only a very vague generalization.

Plates Sticking in Magazine Changers. — This trouble is generally due to carelessness in charging the camera. It is important to see that each plate is truly placed in its sheath, and not projecting at either side and allowing sharp edges or corners to

Fig. 26. F. C. L.

OUT SHOPPING.

Fig. 27. F. C. L.

THE THREE GRACES.

catch or jamb. Again, the sheaths may be put in the camera wrong way round or upside down. With most cameras of this kind there is only *one right* way of loading, and every care should be taken to see that this is the way it is done.

Depth of Focus.—It is of first importance that the Hand-Camera worker should have clear ideas on this subject. We therefore invite his *very* careful attention to the following résumé of the matter. First let the reader clear his mind of the common notion that depth of focus is a special property of certain lenses. This is a misleading way of regarding the subject and should be dismissed from the mind.

It is desirable that the reader will not be content with merely reading the following notes, but that he should verify the statements by a few "personally-conducted" experiments and observations. These may be made in any room, in the evening. We only need three lighted candles, which may very conveniently be fixed in the necks of three empty wine or other bottles of one uniform height. We also need a lens and bit of ground glass. We can conveniently use a hand camera with the sheaths removed and a piece of fine ground glass put in position of the front plate.

First put one of your lighted candles in the middle of the room, at A. Now focus its image as sharply as possible on the focussing screen of the camera, C, using a large stop, say *f*/8. Now get a friend to place the second candle, N, a little nearer to the camera than, and just so far in front of A, that its flame is sufficiently sharply defined for a well-shaped image. Similarly the third candle, F, is put beyond A, and at such a distance that it is in as sharp focus as N. Of course, N and F will not be quite as sharp as A.

C (f/8) . . . . . N . A . . F . . . . . .

We may now call A the "focal point," N the "near point," and F the "far point." Thus objects between N and F will be sufficiently sharply defined for practical purposes. Then our depth of focus ranges from N to F, or N F is the depth of the "focal field."

Next we change our *f*/8 stop to *f*/11, and now find we can shift F a little further away, and also bring N a little nearer to us and yet keep N, A, and F all in nearly and practically equally good definition.

C (f/11) . . . . . N . . A . . . F . . . . . .

Thus a smaller stop has given us a greater depth of focal field. Again changing the stop *f*/11 to *f*/16, we find a still greater and similar change, thus:

C (f/16) . . . . N . . . . A . . . . . F . . . .

Hence we may say that other things remaining the same, the smaller the stop the greater the depth of focal field, *i.e.*, greater distance between N and F.

Our next observation is that F is always further away from A than is N, in other words, A F is always greater than A N. Again, this is more noticeable with a small than with a large stop, so that while A N is only a few inches, A F may be many feet. (To confirm this one should make a few observations out of doors, where distant objects may be included).

So far we have retained C and A in the same position and observed the effect of a change of stop.

Now let us begin again with *f*/8, and with A about the middle of the room, thus:

C (f/8) . . . . . N . A . . F . . . . . .

If now we bring A nearer to C, we shall also have to move both N and F nearer to A, thus:

C (f/8) . . . . N . A . F . . . . . .

On the other hand, if we move A further away we soon find that F is up against the wall of the room and N also is further away from A, thus:

C (f/8) . . . . . N . . A . . . . . F

Hence we see that the depth of focal field depends on two things: First, on the *f* value of the stop in use, and secondly, on the distance of the focal point A, or object in sharpest focus.

It will now be easy to see that by moving A further and further away we shall arrive at such a state of affairs that F is at an infinite distance, so that everything further away from us than N is sufficiently sharply defined for practical purposes.

We can now understand the principle of the "fixed focus camera." Thus matters are arranged so that the lens is so far from the ground glass (or position of plate or film) that the far point, F, is at infinity and the near point, N, is at a known or easily calculated distance. We can then say that with such a camera, all objects beyond — feet are in focus. If the worker does not include objects nearer than this distance limit, he will not require any focussing apparatus.

So far we have tacitly assumed that one and the same lens was under consideration. If, however, we change this for a lens of longer or shorter equivalent focus, then while the foregoing general principles and observations will still apply, yet the actual distances between the camera and N, A, and F will be different. One point more must be noted. We have said the objects, N, A, and F will be equally sharply defined for practical purposes. This may be so for contact printing, yet on enlarging we *may* observe a difference between the sharpness of A and N or F. As a matter of fact, if the point A is in sharpest possible focus, then N and F must be less sharply defined. Experience, however, shows us that if the slight blur, or a small object, a line, or point, does not exceed $\frac{1}{100}$ inch, the normal eye will not notice this. It is, therefore, usual and convenient to base calculations on the assumption that the disc of confusion or width of blur shall not exceed $\frac{1}{100}$ inch.

It should be carefully observed, however, that the table below gives approximately the focus point A. But to take full advantage of the foregoing we should observe that *when the far point is at infinity, the near point is half-way between the lens and the focus point.* For example, suppose we are using a 6-inch lens with *f* 8. If we adjust the focussing scale for 38 feet as our focus point, then we may have objects as near as 19 feet, and these will be as sharply defined as objects at a great distance. This matter is usually ignored in tables showing focal field, but it is one of very considerable practical importance.

A Table showing the distance (in feet) beyond which objects are (practically) in focus, *i.e.*, assuming the disc of confusion does not exceed $\frac{1}{100}$ inch :—

	Equivalent Focus of Lens (in inches).						
Stop.	4	4½	5	5½	6	7	8
f/4	33	42	52	63	75	102	133
f/5	27	34	42	50	60	81	107
f/6·5	24	30	32	46	55	74	96
f/8	17	21	26	31	38	51	67
f/11	12	15	19	23	27	37	48
f/16	8	10	13	16	19	25	34

Example.—When using a 5-inch lens our nearest object is about 25 feet distant, required to know what stop to use? Under 5-inch lens and opposite *f*/8 we find 26 feet. Thus if we adjust our focussing scale for 25 feet and use *f*/8, then all our picture will be in sharp focus.

The hand-camera worker usually is only interested in one lens, and so can easily commit to memory the focus and near point for his several stops, when the far point is at infinity.

But it often happens that our subject does not include any very distant object, indeed it may all lie within a range of a few feet. Clearly, the above table does not apply. Nevertheless, if the reader has grasped the foregoing notes as to focal field, near and far points and so on, he will properly conclude that a table of near and far points would be of use when he is anxious to know the largest stop available for such distances. For example, he may be dealing with a group of boats in the harbour, the nearest one is 15 feet and the furthermost 50 feet. They are in gentle motion owing to the incoming tide. The question is—which stop to use and where to set the focussing scale so that the shortest possible exposure may be given? To meet such cases we have worked out a table for a lens of 5-inch equivalent focus. Fractions have been approximated to the nearest foot.

Fig. 28. W. G. Hill.

In York Minster.

P. O. P. COMPETITION. CERTIFICATE.

Fig. 29. F. C. L.

WINTER MIST.

Fig. 30. F. C. L.

A SPLASHY CORNER.

Table showing the practical depth (in feet) of focal field with a lens of 5-in. equivalent focus.

f/6·5	*f*/8	*f*/11	*f*/16	*f*/22
		4—**6**—8	4—**6**—11	3—**5**—11
6—**8**—11	6—**8**—11	6—**8**—13	5—**8**—21	4—**7**—32
8—**10**—14	7—**10**—16	7—**10**—21	6—**10**—43	5—**9**—Inf.
10—**15**—28	9—**15**—35	8—**15**—71	7—**13**—Inf.	
12—**20**—53	11—**20**—87	10—**19**—Inf.		
14—**25**—114	13—**26**—Inf.			
16—**32**—Inf.				

Note.—The figures in heavy type are the focus points, and those to right and left the far and near points. Thus under *f*/8, if the focussing scale be set at 15 feet, objects between 9 and 35 feet distance from camera will be sufficiently sharp.

In the example just quoted our near and far points are 15 and 50 feet. Under stop *f*/6·5 we find that if we focus on 25 feet our near and far points are 14 and 114 feet. This embraces the distance required.

Again, suppose we are dealing with a bit of carved stonework; the nearest point is 6 feet and most distant part 12 feet away. Under *f*/11 we find a range of 6 to 13 feet when the focus is adjusted for 8 feet on the scale, and so on.

One more example. We wish to take a distant panorama with objects as near as 10 feet. Under *f*/11 we find that when the focus is set for 19 feet we have a range from 10 feet (really half 19 feet, or 9½ feet) to infinity. This meets our case.

Just one more example. We are dealing with trees swaying in the wind, and on account of movement we must use a stop not smaller than *f*/11. The nearest part of our subject is 9 feet and most distant 60 feet away. Looking at the ranges under *f*/11 we find 8—**15**—71. This meets our case, so that we can use *f*/11 with safety if the focussing scale be set at 15 feet.

Pictorial Pointers for Hand-Camera Workers.

By THE EDITOR.

ONE need hardly say that the same pictorial principles apply to picture making by a camera held in the hand, or supported by a tripod. But the fact remains that certain faults are more likely to happen in the one case rather than in the other. It is now our chief intention to call attention to, and in certain cases exemplify, these more frequent mistakes.

On another page something has been said about the effect produced by a high or a low view point. Let that now be taken for granted and remembered in conjunction with the notes here below set forth.

Focal Length of Lens.—In general the lens of a hand camera is of somewhat short focus for good pictorial effects. Thus on a 4 × 3 picture the focal length generally used is 5 or perhaps 5½ inches. Now it is not always fully recognised by the beginner that a short focus lens includes a comparatively wide angle of view, consequently diminishes the size and scale of the object, and at the same time makes near objects *appear* to be relatively too large when compared with similar distant objects. This gives an unnatural or exaggerated perspective effect.

In Fig. 14 we have an old white horse and a young donkey. This latter is much nearer to us than is the former. But in the illustration the two animals appear to be more or less the same size. The fault is due to the donkey being too near the lens. Street scenes with figures too near the camera are familiar examples of the same effect.

In Fig. 15 the same effect or defect is shown under somewhat different conditions. In this case we are concerned with the relative apparent size of the near houses to our right and left as compared with the more distant, but really larger, house at the bottom of the street. The horse and carriage which are only a few yards distant seem

quite a long way off, and insignificantly small when compared with the cottage window to our right. In the same way the width of this little village street is here made to appear greater than it is.

Down-hill Effect.—Note that the down-hill effect is here obtained by keeping the camera quite level, and bringing into prominence the descending vanishing lines of the cottages to our right and left.

Tilting the Camera.—The next very common fault is that of tilting the camera when dealing with architectural subjects. The effects of this may be seen in Figs. 19 & 20. In the case of 19, the upright lamp post seems tilted over towards our left, while most of the vertical columns of the building are tilted to the right. Thus—vertical parallel lines which in nature are thus—| |, are by tilting the camera upwards made to converge thus—/\.

A still more marked example is shown in Fig. 20, where the camera was pointed upwards at a very considerable angle. If this picture be held vertically, and opposite the level of the eyes, it conveys the impression that the tower is falling backwards. But it may serve to illustrate the effect of the relative position of head and picture. Let the reader lean back in his chair and throw the head well back as though looking up towards the top of a near high building. Now raise the picture well up above the head, but holding it in the vertical plain. In a certain position it will assume a strikingly realistic effect, and appear no longer tilted.

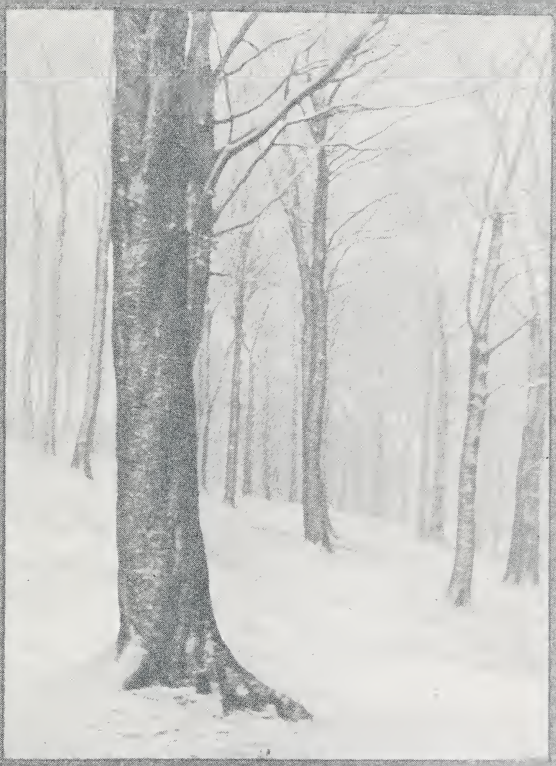
Similar effects may be observed and produced by looking down upon buildings or street scenes from an elevated view point. These pictures can only appear at all natural if viewed by looking down upon them. These two examples, 19 & 20, may serve to show the importance of holding the camera level when dealing with architectural subjects.

Distortion.—However, should it be desirable to tilt the camera for special reasons, the falling backwards effect can be removed by making a transparency and a new negative in the manner

is not very pictorial. Had the operator waited till described in No. 3 of *The Practical Photographer* on page 15, *sub* Distortion.

Figure Studies.—We now pass to one or two of the more common faults in connection with the treatment of figures. In Fig. 22, we first notice that the buildings are all leaning towards one side. This tells us that though the camera was held *level*—yet it was not held *horizontal*, *i e.*, one edge was lower than the other. Fortunately this defect of the print can be got over by careful trimming, but the defect is here left apparent to point the moral and serve as a caution. Now with regard to the figures, we find them showing us various pictorial faults. First, they are too large for the picture space. Second, they come too near the centre and are too similar in pose and too symmetrically placed. Third, there is too much space in the picture below their feet, and not enough above their heads, *i.e.*, they are too high up on the picture plane. Of course, most of the above faults can be more or less overcome by enlarging and trimming, but the negative is printed just as it is to convey the above hints. In Fig. 23 we have another set of faults, while some of those in Fig. 22 are avoided. The figures are relatively better placed, but in this case some are staring at the camera. The background is too black and white, and not at all suitable. The walking figure to our right is a disturbing element, though not in quite so grotesque a position as one sometimes sees portrayed in hand-camera work. The group is too central, and the plate should have been the other way round, *i.e.*, for a vertical picture.

Street Scenes.—We now pass to a couple of street scenes, Figs. 26 & 27. In the former, two ladies "Out shopping," are caught as they pass beneath a shady tree. This example shows how one may carefully measure one's distance from a certain object or position, make all adjustments, and then wait until some happy grouping presents itself. In this instance, the figures well suggest *motion*, but for the chequered light and shade on



them. Had they taken just one step further forward, a far better result would have been secured. The hand-camera man must not be in too much hurry on the one hand, and on the other hand must not miss an opportunity by being too slow and let it slip by. From Fig. 27 we may take the warning not to cut our picture in half by a hard line running from side to side. Again, there is rather too much foreground space.

Moving Objects.—Figs. 29 & 30 illustrate objects in motion. From 29 it will easily be inferred that the negative was taken one foggy winter's morning when the streets were slushy with snow, and the horses' breath made steam clouds about their noses. Except the near part of the snow, no portion of this picture is in sharp focus, yet quite sufficiently so for a suggestion of movement. It is a great mistake to suppose that objects in motion must be snapped at such a speed that they seem "dead sharp all over." Indeed, if they appear dead sharp, then the suggestion of motion is really destroyed, though we may *infer* movement from the positions.

In Fig. 30 we have another example of suggested motion in a wave splashing up against a stone-work structure. Little or no part of this splash is quite sharp, *i.e.*, free from blur; but the slight displacement better conveys to the eye the general impression of such a scene than a picture wherein all the movement was eliminated, and the water appearing more like an immovable block of ice, rather than moving splashing water.

So far for the few illustrations that we have been able to include. These however are only a tithe of what one would desire to give in order to show the common faults.

Size of Figures.—The smaller the finder the more difficult it is to quickly realize the precise proportions of the various parts of our picture. Hence, figures in the near foreground, which seem quite tiny in the finder, often come out too large in the print. Similarly small but undesirable objects, *i.e.*, patches of black or white, ugly bits of line or form, and unpicturesque objects generally, if small or distant in nature, are so very much smaller on the finder that one is apt to overlook them.

Unsuitable Subjects.—It is not wise to attempt subjects showing strong light and shade contrasts unless the light is good, and an ample exposure can be given. Indeed with such subjects it would be better to err slightly on the side of over-exposure, so as to somewhat subdue strong chiaroscuro: for under-exposure in such cases is practically fatal so far as pictorial rendering is concerned. By strong contrast subjects one means—a snow-clad landscape with near dark tree trunks, rocks, etc.; narrow streets one side in strong sunlight, the other in sharply defined shadows; dark boats and black or red sails in the near part of the scene with brightly lighted land or waterscape beyond; brightly lighted landscape or architecture as seen through an open door, archway, etc; figures in black or red and white costumes, and so on. In considering light and shade, one must not forget that reds, dark greens, browns, etc., are equivalent to blacks in such cases.

Unnatural Effects Due to Too Rapid Exposure.—These are by no means uncommon in the case of rapidly-moving objects, *e.g.*, people running, horses jumping, etc. The human eye, when viewing such subjects, does not see so many separate motions or parts of a motion, but takes in a combination of many positions, and so acquires the impression of movement. But a very rapid shutter may isolate one of a series of positions which the eye has never seen as a separate position. Hence we see galloping horses sometimes presented with the legs stretched out fore and aft in a way only familiar to us in the wooden rocking horse of the nursery or merry-go-round. Again, take one very simple and common case, *e.g.*, that of a man seen side-face walking across the line of sight. We may catch him at the moment when one leg is passing behind the other. Such a position, of course, exists as one of many positions in those making up the movement. But this one position gives a doubly false impression. It shows us a one-legged man and a man standing, not moving. Again, a man walking may be caught with the forward foot at its highest point. This again conveys the impression of a man trying to

regain balance after having kicked an invisible football, and suggests motion backwards rather than forwards.

Moving Objects.—In general with moving objects there is a period or phrase in the series of movements which is especially characteristic and significant of the motion. It is this which obviously should be striven for. Let us take a homely illustration, *viz.*, that of a swinging pendulum. If our view shows the pendulum sharply defined at the lowest point of the swing, we should rightly say that this suggests the position of rest—not motion—for we know that this is its position of greatest velocity when swinging. Again, if we sharply define the extreme end of the swing, we should from knowledge say at this point also we know that the oscillating pendulum is at its point of rest when changing from the upward to the downward swing. But between the point of rest and of greatest velocity we should infer that it was moving, provided always that other conditions were favourable to this position. Similarly we should avoid showing a jumping horse or man at the moment of springing from or arriving upon the ground. And so on with the batsman, bowler, oarsman, runner, tennis player. Pictorially, we should be more likely to be interested in the trees swaying in the wind, the gentle roll of the flowing tide, the ploughman at the turn of the furrow, the haymaker loading the cart, the harvester swinging his scythe, and so on.

Fortunately for the picture-maker, the characteristic phase is usually not that of greatest movement, but either just before or just after—the one showing a gathering effort, the other a recovery after effort.

Pictorial v. Scientific Truth.—Reverting to our swinging pendulum example, this may be caught at the moment of greatest velocity, *i.e.*, with bob at the lowest point, and so sharply defined as to give the same photographic effect as a pendulum taken at rest. Scientifically, such a presentation is true, in so far as it shows something which existed in fact. Pictorially, it is untrue, in as much as

it does not correspond to the visual impression normally and generally apprehended. This simple principle is of general application, and should not be lost sight of either by the scientific or pictorial worker, who so often misunderstand each other on these matters. The hand-camera would-be-picture maker must not forget that a sharply-defined rapidly-moving object does not and cannot convey a pictorially true impression. Artists from early times have recognised this, and have sacrificed definition (or detail as the photographer often confusingly calls it) to a suggestion of movement.

Detail v. Definition.—Detail may be absent or present in the object itself. If present, it may be largely obscured, if not lost, by inadequate contrast of light and shade. Thus, low relief in a carving may be obscured by a soft front light, and emphasized by a strong oblique light. Again, faulty exposure or development may obscure detail. Aerial perspective may modify detail.

Definition is a matter of optics so far as the hand-camera man is concerned. The object may be out of focus, or the exposure so long that appreciable blur is the result. Halation may obscure detail.

Blurred Foregrounds sometimes spoil hand-camera pictures. Thus the worker may be "shooting" at some object over the top of a hedge and not observe a leaf in front of the lens which does not show on the finder, either because it is too small, or because it does not come in front of the finder lens. Similar mistakes may arise with railings, rigging, etc. Again, some near object may be so near as to be quite out of focus. (See depth of focus).

Proportion of Figures to Picture Space.—This point calls for great care, as the finder does not always convey a truthful impression. Bear in mind that the finder lens and camera lens are looking at the subject from a slightly different position. Again, a finder that is correct for distant view will not be quite correct as regards limits of subject for a near object. One must therefore be on one's guard not to get figures too large for the picture space, or cut them off across the top of the head or at the ankle.

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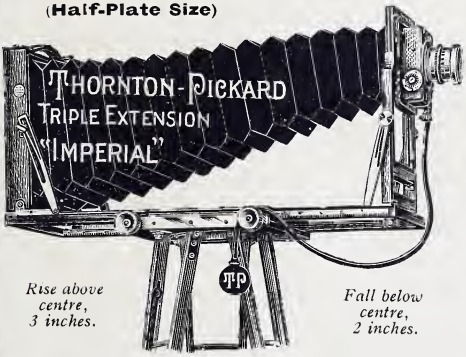

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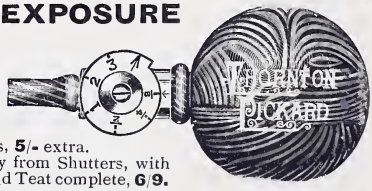

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Print Criticisms.

S. Swinden.—"The Wharfe, Bolton Woods." Your three prints from same negatives, showing range of colours and control, are highly creditable. For the benefit and guidance of others we quote your own words on print No. 3. "Clouds printed into sky, then printed into paper, through back of negative in order to tone down excess of light; print generally sunned down at various points." Our inexperienced readers may here learn a valuable lesson. The operations just quoted are extremely simple, yet just make all the difference between a quite ordinary print showing white water for sky and part of water, and a picture conveying a suggestion of atmosphere and harmonious tone renderings. This print was made on Luna paper, and well illustrates the artistic quality of this brand of P.O.P. Fig. 25.

S. S. (Leeds).—Mount received damaged in the post. Highly creditable example of border printing. You are not quite wise in use of white part of your mount. Very seldom that black or white about a mount does not harm more than help a print. Subject not very pictorial. Original negative is evidently of very creditable quality.

H. W. Chapman.—"Fruit Study," An excellent example of Venus paper printing and toning. Technically good; tastefully mounted. As a composition the picture suffers from two things, *viz.*, the picture space is somewhat overcrowded, and the pyramidal general outline rather too pronounced. The difference of the black and the white grapes is well rendered without undue exaggeration. The outermost mounting paper should have been stiffened by pasting down to stout card. Fig. 21.

R. Smith Porter.—"Winter." This is the least satisfactory of the three. It is too black and white. The snow is nearly all only white paper. Probably you have over-developed your negative, or perhaps got some pyro stain. "Perplexed."—Nearly very good, but spoiled by ugly row of trees in background. Donkey and cart good. Boy not quite natural in expression. "First Aid."—The surgeon's expression is excellent. The patient seems too unconcerned. Your work shows praiseworthy originality, and we hope you will go on with these homely subjects. Your prints show far too much yellow stain. To clear this use a bath of amm. sulpho-cyanide, 5 grains per oz. water. Fig. 18.

James H. Saunders.—"The King's Highway." Very creditable in many respects. The subject is strong through its simplicity. Tone colour too warm for the subject. Sky part a trifle over-dark and heavy towards our left. "Solitude, etc."—Foreground dark, rather too solid and heavy. Too many strong lights (in sky and water), hence lacks concentrated interest. A narrow band round outer margain of mount is seldom satisfactory. "Winter, etc."—Very nearly a medal winner, but just a trifle too weak. The near parts do not look near enough, and the distant parts look too near. You might greatly improve this by careful shading during printing, so as to get a little more strength and contrast in the nearer portions.

A. Cohen.—"A Snowclad Wood." The general turnout of this picture is especially tasteful and praiseworthy. The grey and brown papers used for mounting harmonising admirably with the cold colour and winter sentiment of the scene. Technically the print is well above average quality. Your other prints are not nearly so good technically or pictorially; nor is the mounting so successful. Avoid circular pictures as much as possible; they are *very* seldom satisfactory. Avoid also flimsy mounting papers for the outmost mount. This should be pasted down on to card to stiffen it. Fig. 31.

W. G. Hill.—"In York Minster." Your print shows careful and creditable work throughout. The dark bit of background coming behind the light recumbent figure gives a desirable concentrated interest towards the centre of the picture. Your other print, "Bolton Abbey," is not so good. The similar shaped shadows cast by the two arches—one above the other—are rivals in the composition. The picture lacks a well-marked chief point of interest. Fig. 28.

D. Dunlop.—"Portrait Study." Title wisely kept subdued in size and contrast. Lighting of face broad, simple, and effective. Mounting neat and suitable. Drapery not quite dark enough, especially towards lower corners. Little more shadow wanted on sitter's shoulder. Flower study technically very creditable, but flowers too large for picture space, which looks overcrowded. Too many lines of mount round picture. Kitten crude in colour; too warm red. Texture of fur not satisfactory, looks too much like marble. Fig. 24.

C. B. A. (S.W.).—1.—Looking down upon boats in harbour in this way seldom gives a pleasing picture. High lights too chalky. Your negative is evidently too strong in contrast for enlarging. Reduce it with ammonium persulphate, and try again. 2.—"Sunset." Sky and sea very good, but boat and sail too solid black. Coat back of negative with matt varnish, and scrape away all except that over the boat and sail. The varnish will help to keep back this part during exposure. 3.—"Woodland." Sky and water patch too suggestive of white paper, and upper part of tree to the left far too dark.

R. W. S. (Paisley).—1.—Sky and cloud very fine, but is a little too dark for rest of picture. Try again, and keep sky part considerably lighter. Mounting neat and suitable. 2.—Figure too near camera. and so somewhat out of proportion to the rest of the picture. The large figure dwarfs the distance. While drapery of figure lacking in gradation. You are under-exposing and over-developing your negatives. Remedy obvious.

S. J. W. (S. India).—Your print suggests a negative that has been somewhat over-exposed. Pictorially we do not care for so highly glazed a surface. It is an advantage to suppress some of the detail, especially in the more distant parts of the picture. This adds interest and strength to the foreground, which is nearly always the most important part. Your mount is too ornate. Its complicated pattern takes the eye away from the print. Always glad to help in any way we can.

B. C. (Lincoln).—"Incoming tide" neat and tasteful, and technically good. Inscribing of title rather untidy. Best part is suggestion of cloud and sky. Distant hills a trifle too dark for their obvious distance. Mounting appropriate. "River mist."—Colour too cold and grey even for mist, as the time is evidently summer not winter. The water and sky are too suggestive of white paper, and too nearly the same tone-value even for mist effect.

A. T. (Sheffield).—1.—The writing of title in white ink was a mistake. This white patch is a discordant note in an otherwise very praiseworthy result. 2.—Somewhat over-printed, so that the darker tones are lost in equal blackness. This means a loss of scale and strength. 3.—Blossoms good, but leaves and vase are lost in general blackness. Generally you are over-accentuating contrasts. Your work shows taste and originality. Keep on in your present path, but do not aim at over-strained effects of light and shade.

L. W. (E. Ham).—1.—Technically very good. The pillar of the tomb is too central for good composition. Seldom, if ever, that so light a mount suits a print with strong shades as this. Is not this subject rather a curious one for a season's greetings? Colour of print rather too red to be quite pleasing to our taste. 2.—Contrast of light and shade somewhat too strong, due to under-exposing negative and then carrying development too far.

R. J. B. (Dublin).—Please always put your name on back of print. Generally your picture is highly creditable, and atmosphere nicely suggested. Colour a little too foxy red for best pictorial effect. The one disturbing note is a white patch on the dark scale on the right margin of print. The edges of a picture are always weak, and should not have patchy contrasts when such can be avoided.

R. L. (Co. Cork) —1.—Figures in strong sunshine are seldom pictorial. Apart from the colour of nature they are apt to be patchy. The small patch of light on right cheek just destroys unity of effect. 2.—The ground rises up too much, *i.e.*, camera should have been lower down. You have not sufficiently focussed the attention on any special part, hence the interest is too scattered. 3.—The background is not quite sufficiently subdued. It is too light in tone, and too sharply defined, and too liney. The objects are too symmetrically arranged for harmonious effect.

A. C. (Leeds).—All three prints show considerable taste and commendable simplicity. The flimsy paper mounts have a rather untidy effect. The outer paper should be pasted to stout card. Your tendency is to use *too many* different mounting papers for each picture. Better be contented with two or three at most. Your prints incline to over-strong contrasts of light and shade. Do not carry development of negative quite so far.

C. T. (Harrogate).—Please always put your name on back of each print. 1.—It is very seldom indeed that a landscape can be vignetted satisfactarily. It always gives an unreal effect. 2.—Back of camera not quite vertical. Exposure not quite enough. Developing a little over-done. Negatives of interiors should be soft rather than plucky. They are generally over-developed. 3.—Generally too black and white. Your details of production are very scanty. This negative has been under-exposed and over-developed.

E. T. R. (Cranlington).—A marked improvement. You must get the lettering of your titles a little neater and more regular. Study the samples in Fig. 17, No. 4, *The Practical Photographer*. Do not overdo the number of mounting papers. Your No. 2 is the most successful, but No. 3 is also admirably harmonized. Glad to see you are using carbon. It is a valuable process, with great possibilities and a fine choice of colours. Shape and trimming of 2 better than 3. In 1 you have too many different colours in your mount. The picture is excellent, though somewhat overpowered by the brightness of the surrounding colours.

M. B. (Campden).—1. Texture quality of drapery excellent. Expression somewhat wooden. Arrangement admirable. 2. You are not up to your usual form here. The texture is lost and high-lights hard. Sitters are too large for the picture space. The bit of carving seems out of harmony with the rest of the subject. 3. The countless little spots are somewhat irritating, and generally too much insistence on unimportant detail. The art of picture making is the art of leaving out.

R. M. (Grangemouth).—Mounts too flimsy. Should be stiffened by pasting down on to cardboard. Edges of print rather raggy. Use a sharp knife and cut on bit of thick card. You are slightly over-printing. Remember that a print when dry looks a little darker than when wet. 1. You were too near the horses. This makes them appear disproportionately large compared with the ploughman. 2. Horses coming too straight towards camera. Cut away 1¼ inches from left side. Sky in 1 and 2 very good. 3. Either more tree or less tree should have been included. The portion now makes an awkward corner patch.

A. E. T. (Durham).—2 and 3 are technically better than 1. Do not care for the subject of 2, and 3 lays you open to the charge of mutilating a well known very similar study. The way the background rests on the floor rather betrays you. Get a better junction line next time. 1. Always strive to avoid anything like a conscious expression, especially with children. Mounting and titles tasteful. Work generally very promising. Go straight ahead.

Miss I. (Cheadle).—1. Chief fault here is the flat sky. Might be vastly improved by slightly graduating so that the upper part is a trifle darker than the lower. Figure rather too obviously posed. 2. The black and white bands round print are not wanted. These are the first things one sees. Hold this print at arm's length; close, open and again quickly close the eyes. This experiment will show that these black and white bands are the strongest notes in the scale. This should not be the case. 3. Much the best of the three, and only wants the sky slightly toning down to suggest atmosphere rather than paper.

J. L. P. (Herne Hill).—Highly creditable good technical work. The bit of sky and roadway are too light. You need a little more care in the lettering of your titles. See Fig. 17, No. 4, *The Practical Photographer*.

Mrs. H. M. P. (Stonebridge).—Very neat and careful work. White band round print overpowers high-lights of your picture. Personally, we do not care for very glossy surface. Try this negative on a rough surface cream paper bromide, and you will at once recognise the pictorial advantage of a non-shining surface.

J. A. L. (Wallington).—Three very creditable flash-light pictures.. But in all cases you have somewhat over-developed and got the high-lights a little too dense, so that gradation is lost and detail in the shadows somewhat obscured. Next time have your light more to one side, and use a large sheet or table cloth as reflector on other side to soften the shadows and diffuse the light. Do not carry development quite so far and print on special P.O.P., which is very useful for strong contrast negatives.

Miss S. (Surrey).—Sky part weak in all three. A cloudless, ungraduated sky space is more suggestive of paper than sky and atmosphere. 1. Reflection of tree in water is too strong to be pictorial. Tree too near centre of picture for good composition. Distant hills nicely rendered. 2. The nearly straight river bank edge cuts the picture in two parts. The protruding tree branches at side should have been avoided. 3. Woodland scene, your best print. Near trees should be a little darker than those in middle distance.

M. N. T. (St Anne's).—Please put your name on the back of prints. For this kind of subject (architecture against sky) a backed plate is needed for best effect. The sky part being blank, white paper gives an unreal effect. One cannot tell where the sky and margins of print are. The sky part should have been slightly toned down. Exposure and development and point of view are all very creditable.

H. S. Prince.—Good even work throughout. *Norwich Cathedral.* This is the best. The tone value of the mount is too near that of the print. A little more contrast is required. *Landscape.* Foreground foliage excellent, but the white sky and over dark patches in middle distance are too strong in contrast, and come too forward. *Seascape.* Clouds and reflection in water admirable. Distant land is too dark, and seems too near us. Do not care for the ornate style of mounting.

W. J. Appleby.—Thames Jetty. Very tasteful in arrangement and skilfully treated. but unkindly dealt with by use of four different colours of mounting. A simpler style would be far better. It is seldom that one can effectively use more than two different colours of mounting paper.

H. Light.—Both examples show good and careful work. *Whitby.* The mount is rather too light in colour, making the high-lights of your picture appear somewhat weak, and also making the darker parts rather too solid and heavy. Try a moderately dark grey mount. *Shipping, etc.* In this case you have too many small objects for the size of your picture. If enlarged to 10×8 or 12×10 this would not appear too markedly. The water is well rendered, but the houses on the left are too sharply defined.

F. G. P. (Cramlin).—Your T Y O toned S.C.P. print is very charming in colour and quality, but the composition is somewhot top-heavy. You might advantageously have sliced away the dark band along the top of the picture. Your mounting papers do not lie quite flat, and the lettering of the title is not quite as neat and even as we should like to see it. The best part is the sunlit trees in the middle distance.

G. F. B. (Leeds).—The sky patch and its reflection in the water are too light, and require toning down slightly. General arrangement and colour of print good, but you made a mistake in attempting to match the mount and print. The two slightly different colours are conflicting. Smaller print is not so good, though it has the advantage of a pleasing suggestion of sky and cloud. The negative has obviously been under-exposed and, consequently, the dark parts are devoid of detail and gradation. The distant tree is too sharply defined and does not look distant enough.

A. D. (Wallington).—In your work the pictorial are somewhat in advance of the technical qualities, so that you must pay especial attention to the latter without neglecting the former. First, avoid flimsy paper mounts; paste your mounting paper down on to stiff card before mounting the print; next, keep a careful record of all your exposures, also of the print exposures. 1. Exposure about right, but negative a little over-developed, *or* the print has been overdone. The further cow is awkwardly placed. 2. Exposure not quoted, but evidently it was insufficient for the shadows. Background too "liney." The near vase should have been omitted. 3. High-lights of negative are over-dense, *i.e.*, over-developed and without detail gradation. Try again; do not develop quite so far, and use amidol for paper developer. The texture of the dress is admirably suggested, but the flesh parts are quite wrong.

D. C. M. (Clydebank).—Mount much damaged in transit. Pose of figure and background good. Too many scattered high-lights. Lighting too strong; requires balancing by large diffusing reflector on shadow side. Exposure was not quite sufficient. Landscape generally better than portrait. Sky good. Land part a little too dark in relation to the sky. Do not forget that the light in the sky is the key-note of the lighting of all the other parts. Mounting very tasteful.

G. E. F. (Northfleet).—Evidently a careful worker; but you need a little more practice in certain directions. Do not use ink for writing title on face of mount. See Fig. 17 in *The Practical Photographer*, No. 4, as a guide to desirable styles of lettering. 1. Sky rather over-printed for a snow scene. Tree too near centre. 2. Arrangement here is better. Sky also better, but still a little too dark. 3. Not so good. This negative has probably been over-developed. Your view-point was too high up. This spreads the water out too much over the lower part of the picture.

Messrs. Adams & Co. (26, Charing Cross Road, W.C.) have still further improved their excellent Natti (pocket) camera. It will now have an interchangeable automatic plate-changing and film-changing magazine, taking glass plates, films, or film packs. It is being fitted with a focussing screen and a practically useful and efficient hood or light-shade. We can speak in warm praise of the Natti, which has been a valued friend and obedient servant for a year or more. Its merits, however, are two widely known to need more than the mention of its name. The above improvements will still further increase its efficiency.

Concerning the Keni, the well-known and deservedly popoular hand camera made by Messrs. Adams & Co., 26, Charing Cross Road, it does not seem to be sufficiently widely known that it is available for use with focussing screen, dark slides, film pack, roll-holder, daylight loading, or changing box at will, these being all interchangeable. The practical advantage of this feature has only to be mentioned in order to be recognised.

The Videx Hand Camera (Messrs. Adams, 26, Charing Cross Road, W.C.). —Had Messrs. Adams consulted us before christening this instrument, we think we should have suggested "The Luxurious" as a name, for this instrument seems to combine everything that goes to make hand-camera work a pleasure and a luxury. It would occupy several pages of ours to discuss all the excellent features of this instrument; we must therefore only mention one or two. First, the picture is seen and focussed full size, right way up, on the thoroughly shaded finder right up to the moment of the exposure, the plate or film being all the time ready for the "shot" at any instant. The plate may be changed in the revolving back from horizontal to vertical, or *vice versa*, at any moment. The reflecting mirror, which throws the picture on to the focussing screen of the full-size finder, being in one rigid piece, enables the finest adjustments to be accurately made and seen right up to the edges of the plate. The focal-plane shutter can at any moment be adjusted from the outside either for "time" or rapid exposure, ranging from 1-8th to 1-1000th second. Long or short-focus lenses, plates, or films (flat or rolled) may be used at will. One other point may be mentioned just to show the eminently practical way this camera has been designed and worked out. The focussing screw and exposing trigger or release are on *opposite* sides of the camera, so that while with one hand focussing is being done the other is free to "press the button" at any moment. Had they both been on the same side, then the same hand would have to be used for both operations, and while the hand was going from the focussing screw to the exposing trigger many a time the picture desired would be lost. Truly the Videx is a desirable instrument.

A New Goerz-Anschutz Folding Camera is being introduced for the 1904 season. This has a time and instantaneous focal-plane shutter with adjustable opening, giving not only the well-known small fractions of a second, but also such slow exposures as 1-10, ½, ¾, 1, 2, 3, 4 and 5 seconds—accurately adjusted. This is so obvious an improvement on this already well known and justly popular instrument that it has only to be mentioned in order to be nstantly appreciated.

New Lens.—Goerz Double Anastigmat Syntor. This is especially designed for hand-camera work. It is corrected for spherical and chromatic aberration, and for astigmatism. At *f*/6·8 it covers an angle of 60°, and 70° is covered by use of smaller stops. The back combination makes an admirable single lens of about double the focus of the complete instrument. The Syntor also can be used as the positive element of a Telephoto system with complete satisfaction.

Goerz Telephoto Lens is of special interest in connection with Hand-Camera work. For Cameras with limited bellows extension the mount is furnished with an adjustable ring bearing two marks; the first indicating the position for infinity with the single extension of the camera, the second for infinity when both the camera and extension bellows are used. Focussing is therefore not required when distant objects are being dealt with. Magnifications range from 3 to 6 according to one or other of the above arrangements of extension. Readers may obtain further information gratis on writing to the firm of Goerz, Holborn Circus, E.C., and mentioning this notification. Prices of Syntor lenses range from 65/- upwards, obviously a very low figure for instruments of such indisputably high quality.

The Post-Card Connoisseur, a new Monthly, reaches us from The Collectors Publishing Company. The first number (6d. nett) contains half a dozen specimens which will interest photographers who print their own cards.

A Real Want Supplied.—Messrs. R. & J. Beck (68, Cornhill, E.C.) are now willing to test the speed of any shutter sent to them per post for one shilling, exclusive of postage. But if the owner will call at 68, Cornhill, he may have his *shutter speeds tested* for the entirely nominal charge of *fourpence!* The testing is done by the visual method. The thoroughly reliable nature and scientific accuracy of this eminent firm's manufactures is an unquestionable guarantee that these tests may be relied upon with complete confidence. We repeat that this generous action will supply a very real and long-felt want with all serious workers.

Messrs. R. & J. Beck (68, Cornhill, E.C.) have kindly admitted us into their confidence by showing us an "advance copy" of their new "*Telephoto Cornex Magazine Hand Camera.*" From this name one might suppose this instrument was for use with a telephoto lens only. This is not the case. It is fitted with a lens of 6-inch focus working at *f*/6 in the usual way by means of cornex focussing scales showing depth of focal field. To convert the instrument for telephoto work two bars are moved, the front slides forward, the bars are slid back, and our camera is now some four inches longer than before, yet as rigid and "firm as a rock." A sliding rod now brings into position a negative lens behind our 6-inch lens just mentioned, converting it into a telephoto combination of 18-inch equivalent focus working at *f*/16. This at once gives us a magnification of three diameters. A separate cornex focussing scale is herewith provided, ranging up to objects as near as 36 feet. Two finders are provided. In the first we have our6-inch lens view, and in the centre of this is indicated the small part which can be included in the combination. The second finder shows this as it will be rendered (full size) on the plate. The shutter speeds range from ½ to 1-100th sec. The lens has an iris diaphragm. The plates in sheaths are changed by the turn of a small lever. With the 6-inch lens one can focus up to 6 feet. It will thus be seen that snap-shot telephotography is, under even moderately favourable conditions, well within the range of practical photography. We have by no means exhausted the list of good points of this very attractive instrument, and we feel sure that as soon as it is placed on the market it will at once become recognised as belonging to the front rank of hand cameras.

Messrs. Evans Sons Lescher & Webb (56, Hanover Street, Liverpool), have sent us their profusely illustrated price list. This book is admirably arranged in various sections, *e.g.*, Albums, Backgrounds, Bromide Enlargements, Bottles, Burnishers, Stand Cameras, Roll Film Cameras, Hand Cameras (in countless variety, from 2s. upwards), Enlarging Apparatus, Carrying Cases, Plates, Dishes, Dark-Room Lamps, Lenses, Mounts, Chemicals, Optical Lanterns, and a thousand and one other things, great and small, that the photographer, sooner or later, finds needful for his convenience and comfort. Messrs. Evans have kindly told us that they will send gratis and post-free a copy of this indispensable book of reference to anyone mentioning *The Practical Photographer* and the name and address of the chemist or dealer from whom the photographic apparatus or materials are usually obtained. This is an offer not to be missed.

Messrs. Elliott, Barnet, have kindly submitted for our inspection a tasteful and effective series of show cards in considerable variety. These refer to Plates, Papers, Films, Carbon Tissue, Gaslight Papers, etc., and show striking examples of the possibilities of these manufactures. Dealers who have not received specimens of these cards are invited to put themselves in communication with Messrs. Elliott & Sons without delay.

A New Bromide Paper has been introduced by Messrs. Elliott, and known as "Barnet Lustra Matt." On trial we find this very beautiful preparation yielding a brilliant and rich print without the glossy surface, which is objected to by so many workers. We may roughly compare the surface of the print to that of a very finely ground opal glass—snowy white and bright, yet matt, *i.e.*, a lustrous matt, as the name implies. The accompanying instructions include metol, also metol-quinol developers, sulphide, and also hypo-alum toning baths. This is an ideal paper for use in conjunction with small negatives, and the hand-camera man has only to try it in order to recognise its merits.

Notice to Dealers in Photographic Goods.—The wholesale house of Messrs. Fallowfield have just started *Fallowfield's Courier*, an up-to-date, informative little pamphlet on matters of vital interest to dealers (in photographic goods), to whom it will be sent post-free on application. For obvious reasons this will *not* be sent to amateurs. The welcome promise of a coming record season in photographic trade should make this leaflet of special interest at the moment.

Messrs. Chas. Zimmermann & Co. (9 and 10, St. Mary-at-Hill, E.C.) have shown us two forms of *Velo-Klopp Hand Cameras*. They are both fitted with roller-blind shutters having adjustable speeds. The plates are carried in a double back of such small thickness that three slides occupy about the same room as one slide of the old pattern. A focussing screen is provided. In one form the camera front is instantly set in position by simply pulling it forward, when it is automatically and firmly clipped. Focussing is done by a special lens jacket. A direct view finder is provided. In the second form the front slides along a base-board fitted with focussing scale, screw and brilliant finder. Liberal rise and fall of the lens is neatly arranged for Both these instruments are well-designed and finished, readily closing into a surprisingly small space. Leather cases and carrying straps are included in the outfit. These instruments are thoroughly practical, and should certainly be inspected before the choice of a new camera for the coming season is made.

Messrs. Fallowfield (146, Charing Cross Road) have kindly shown us a new and improved form of their Falloroll, or pocket camera, taking plates, cut, or roll films at will. A focussing screen and bushes are provided for work with a stand. The special point about the new form is that it is fitted with a double-extension front and two focussing scales—one for use with the complete lens of 6-inch focus, the other when the back part only of the lens is in use; focal length approximately double that of the complete combination. The front not only has a generous measure of rise and fall, but has a side slide. By the simple but ingenious introduction of a removable black card in the back, the usual cockling of the film is largely, if not entirely, obviated, thus securing a more uniform range of definition. Several other new minor features are introduced. Price complete, with one double back, £5 to £9, according to lens selected. The name Fallowfield is sufficient guarantee that the instrument is thoroughly reliable in every respect.

Messrs Lizars, (20, High Holborn) have brought to our notice several items of special interest to Hand-Camera workers. To the deservedly popular **Day-spool** series of pocket folding cameras has been added a new size, viz., the post-card. taking films $5\frac{1}{2} \times 3\frac{1}{4}$, or plates $5\frac{1}{2} \times 3\frac{1}{2}$. Dark slides can be now used without the intervention of an adapter, a practical point of no little convenience. Among **Magazine Cameras** their "Challenge" holds a foremost place. For three guineas is included a Beck Symmetrical Lens, B. & L. Shutter, a rack focussing device whereby the head which is turned to adjust the focus at once shows the distance of object in focus, so that one does not have to turn a screw *here* and then look *there* at a scale; a reliable changing arrangement for twelve plates or films in sheaths, etc.

The Lizars de Luxe is, as its name implies, a really luxurious instrument The front admits a rise sufficient to bring the lens level with the top of the plate. A cross movement is provided. The lens also swings up or down, and this ingenious front further forms an extension front of great rigidity. The base has double extension, and the baseboard may be dropped for wide-angle work. The ground glass is fitted with a focussing hood. Messrs. Lizars make a speciality of "Hand or Stand" Cameras, and their de Luxe is certainly one of the best solutions of this many-sided problem. Lenses of various makers and focal lengths are readily adaptable. Anyone in search of an all-round instrument ought to inspect this camera before final decision.

Messrs. Watson, (313, High Holborn), have shown us an advance model of their **1904 Alpha** Camera, which will be ready for delivery by the time this note reaches our readers. This camera has a focal-plane shutter built into its body. The slot is adjustable in speed and width from 1-5th to 1-1000th second exposure. Time exposures can also be given with it. A neat form of hood is attached to the focussing screen. The front has rise and cross movements. The bellows ($\frac{1}{4}$-plate size) racking out to about 13 inches, thus enabling one to use the half of a compound lens. The Holostigmat series of lenses thus giving us a very convenient choice of three foci in one instrument.

This firm have also a new Argus Reflex (full-size finder) Camera of a somewhat similar character. We have been promised a sight of this instrument as soon as it is in showable form, and hope to give our readers the benefit of an early notice. The Hand and Stand Camera man may be reminded that this firm have a folding aluminium tripod which has certain highly desirable features.

Messrs. Kodak Regent Street, Oxford Street, Strand, etc.) have been kind enough to show us their very latest camera models and improvements. The general characters of these instruments are so widely known that it will be best for us to refer only to the *new features*. To the world-renowned F.P.K. ("Folding Pocket Kodak") series has now been added a new, *i.e.*, post-card, size ($5\frac{1}{2} \times 3\frac{1}{4}$), hereafter to be known as 3A F.P.K. This has a rising front controlled by rack and pinion (an important feature of considerable practical value), and also cross front movement, which, of course, becomes a rising front when the instrument is turned on its side. The brilliant view finder has a circular level attached to it, so that one movement reverses the two and one eye can see both together. It also has an improved back carrying focussing screen, and enabling us to use glass plates, cut films or roll films at will. It may be added that the firm are now ready with plates as well as films for the post-card size. The No. 4 cartridge 1904 model now has *two* levels, and is provided with a B. & L. everset automatic shutter. The Premo $\frac{1}{4}$ and 5×4 cameras, in both folding and box forms, are now especially arranged to take film packs. The **film pack**, which possibly has not yet been seen by all our readers, may be roughly compared in shape and size to a double-back or plate holder, and contains a dozen cut films. It is put in position just as though it contained a couple of glass plates. To uncover a film we gently pull a stout black paper tag upwards as far as it will go, and then tear away the paper tag. The film is now uncovered in the camera ready for exposure. After exposure we similarly pull out tag No. 2; this covers film No. 1, and brings film No. 2 up in front of film No. 1; similarly for the whole dozen films. The film pack is beyond question one of the most valuable additions to present-day photography, and is sure to be in immense demand.

Messrs. Newman & Guardia (90-92, Shaftesbury Avenue, W.) have sent us their catalogue of cameras varying in price from a guinea to fifty pounds. This admirably illustrated list is as thoroughly prepared and well arranged as any of the cameras by this firm, whose name stands for neatness, efficiency, skilled workmanship, and, in brief, everything which a desirable instrument should possess.

Messrs. Fuerst (17, Philpot Lane, E.C.) inform us that they are now sole agents in the United Kingdom for Pinachrom and Pinaverdol, two new sensitizing dyes for orthochromatic work (about which we may have something to say in a subsequent number). They have also sent us an exceedingly useful reference list of other dyes for which they are the sole agents.

The Wizard Camera Co. (32-34, Featherstone Street, E.C.) have kindly given us an early and privileged view of three new cameras which will be ready for sale by the time these notes reach the reader. The Wizard "Duplex" has a readily detachable back which takes roll films in the usual way. Suppose half the film length of exposures has been exposed, then we may insert a draw-out shutter in front of the film. Pinch a spring and the back comes away, leaving an ordinary camera ready for focussing screen or plate holder carrying plates or cut films in holders. The front is controlled by rack or pinion, which, by pushing in or out, is free or locked as one may require at the moment. The next pattern (made in four different grades and known as the Wizard "Star" series) is of the compact pocket form. It is instantly got ready for action by means of an infinity catch, and has also a long extension bellows for use with the back portion of the lens for distant objects. This has a good rising and cross front action. A third form "Ideal" Wizard has a reversing back, long extension, rising and cross front, locking rack arrangement, and is especially, bnt not exclusively, arranged to take a film pack. This camera, which weighs only 24 ozs. and closes to $5\frac{1}{4} \times 5\frac{1}{4} \times 2\frac{3}{8}$, is offered at the conspicuously modest price of 75s. All the above cameras are fitted with the renowned Wollensak shutters, which are remarkable for their compactness and ease of silent manipulation.

Picture Framing is a subject which no ambitious photographer can afford to ignore. In exhibitions the harmony or discord between print, mount and frame often determines the assigning of an award to one of two approximately equal prints. Our London readers may be glad to know that **Messrs. Pickard & Co.** (138, Aldersgate Street) have a large assortment of mouldings suitable for use in connection with photographs for exhibition or home decoration.

Messrs. Thornton & Pickard (Altrincham) send us a copy of their 1904 Catalogue, which, in addition to a mass of well-arranged information as to cameras, tripods, shutters, etc., also contains several excellent reproductions of forceful examples showing the very high level of efficiency of the instruments they are selling. The following are a few of the numerous improvements introduced by them this season :—The setting cord of the world-famous T.P. shutter now runs back after being pulled to set the shutter, thus obviating any possibility of an "entanglement." For the new panoptic shutter it is claimed that it gives a greater range of panoptic exposures than any other shutter. A new quarter-plate camera called the Graphic, fitted with focal-plane shutter working up to 1-1000th sec., and capable of giving time exposures as well. This has a ball-and-socket adjustment for tripod work when so required, and thus may be pointed in any direction whatever. The Ruby series of cameras are too well known to need more than mention with the reminder that they have double and triple extensions for long focus, and very compact central adjustment for short-focus lenses, combined with ample movements of back and front. The Imperial triple-extension camera is now obtainable brass-bound for work in hot or damp climates. Also—but, "gentle reader," send for a catalogue, which will be sent you gratis on mentioning *The Practical Photographer*.

The man in search of a hand camera must not omit to possess himself of **Houghton's** little pocket list of hand cameras and sundries, which will be sent him gratis on addressing a post-card, with his name and address, stating his wants and mentioning *The Practical Photographer* as an introduction.

Venus Print-out Paper.—Readers may be interested to know that this paper may now be obtained from the Photographers' Art Co., Parchmore Road, Thornton Heath. The manipulation of this paper is one of the simplest of photographic printing processes, and as to the artistic results there can be no question. The fact that the first prize in our recent print-out competition is assigned to a print on Luna shows this. Luna and Venus paper are very similar both in appearance and general outline of manipulation, though each has its own desirable characteristics.

Messrs. Sanders & Crowhurst, (71, Shaftesbury Avenue), have bought the photographic business (Lanterns, Cinematograph Films, etc.) of Messrs. Williamson & Co., Hove.

The Watkins' Meter Co. have issued a pamphlet (obtainable gratis from all dealers) giving hints for those buying their first hand camera.

The Ozotype Company have sent us a neat little price list of useful aids to this fascinating process. Also a leaflet of improved formulæ brought up to date (March, 1904). Copies of these may be obtained gratis from the company by our subscribers, who will mention *The Practical Photographer*. We are glad to note the steady growth of this interesting and artistic printing process.

Messrs. Houghton's, Ltd. ask us to remind our readers that the Ensign Film Competition closes on May 30th, when £100 will be divided into 92 prizes. Entry forms and full particulars obtainable by post-card sent to 88, High Holborn, E.C.

The Bromide Monthly for March (Rotary Photographic Company) contains the Award List of the recent Rotox Competition. The Company have treated the competitors in a very generous manner, and report that the competition "has been highly successful."

Technics.—This new monthly journal has reached its third number. The initial high standard of contents is admirably maintained. Nos. 2 and 3 contain a well-arranged digest of the present state of expert opinion on the photographic image, in theory and practice, by E. Senior. The author may be congratulated on his handling of a somewhat complicated question in a conspicuously discriminative manner. "Technics" is heartily welcome as a thoroughly sound, practical and scientific up-to-date journal.

A Photographic Survey of Kent is being inaugurated by the South Eastern Union of Scientific Societies. The object is to make and preserve (by means of permanent photographic prints) reliable records of the present condition of objects of archæological, historic or literary interest; customs and costumes of the people; notable events; portraits of prominent people; geology, flora and fauna of the county, etc. A congress of the Societies will meet at Maidstone, on June 9th, 10th and 11th next. Societies or individuals interested in the movement are invited to communicate with H. Snowden Ward, Hadlon, Kent.

Houghton's, Ltd.—The Inaugural Banquet to celebrate the fusion of the firms of Messrs. Houghton, Levi, Spratt, Holmes and Jackson into Houghton's, Ltd., was held at the Trocadero, April 9th, when upwards of a hundred members of the firm, chiefs of departments, members of the press and friends foregathered to celebrate a new era in photographic manufactures. Excellent speeches were made by Messrs. Edgar Houghton, Charles Houghton, Fred M. Isaacs, Alfred Spratt, Lewis Isaacs, E. Smith, H. V. Cox, and the chairman, Mr. George Houghton. All present felt the occasion to be an epoch-marking one. The perfect way in which all arrangements for this eminently successful gathering were made and carried out shows us that whatever Houghton's, Ltd., undertake they carry out in that thoroughly practical and efficient manner which upholds the best traditions of British manufacture.

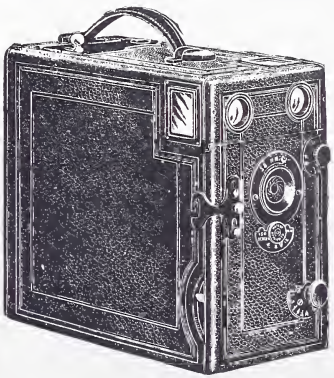
We heartily repeat our previously expressed hope and wish for the unqualified prosperity of the new firm.

Mr. Ryan's Examples of high-speed work (Figs. 3, 6 and 7) are of such exceptional technical interest that we give the following details of production:—Fig. 3, "All together, Boys"—Zeiss lens 8-inch focus, *f*/6·3; midsummer noon; exposure, 1-1000th sec. Fig. 6, "High Jump"—Zeiss 6-inch lens, *f*/6·3; 4 p.m. midsummer; exposure, 1-250th sec. Fig. 7, "Looping the Loop"—Zeiss, *f*/6·3; August, 7-30 a.m., sun exposure, 1-800th sec. All on Imperial plates.

The Ounce?—In reply to several querists, it may be convenient to state that in our formulæ we suppose the ounce to contain 480 grs. (apoth.), but with two exceptions, *viz.*, pyro and hypo. The former generally comes to us in the familiar blue bottles, which are supposed to contain 437½ grs. (avdp.). Hypo is generally sold by the pound of 16 ozs. avdp. (437½ grs.).

Delay in Obtaining "The Practical Photographer."—Several of our subscribers have kindly written to us pointing out their difficulties and delays in obtaining *The Practical Photographer*. In each case we have been able to rectify matters. If any other of our good friends have difficulty in obtaining supplies later than the third of the month, will they kindly send us a postcard bearing their name and address, and we will do our best to help them?

Midg Competition "A." Moving objects. The prize for the A class has been assigned to Mr. F. Mackay, 15, Foxmore Street, Battersea Park, to whom we offer our hearty congratulations. The winning print shows a train travelling at full speed, and emitting vast volumes of smoke.



Special Competition.—Coupon C.

Prize—A 1904 No. 0 Midg Camera

(known as "The King of Guinea Cameras").

1. Prints may be of any size or process, mounted or unmounted, and must show moving water, waves, rivers, cascades, ships, boats.
2. Marks will be assigned for pictorial as well as technical work.
3. The Editor reserves the right to reproduce any print sent in.
4. Competitors must send one, two or three (but not more) prints, accompanied by this coupon, and addressed "THE EDITOR, *Practical Photographer* (Midg Camera Competition A), 27, Paternoster Row, London, E.C."
5. Prints for this competition must be sent in before the first of May, 1904.
6. Prints will not be returned.

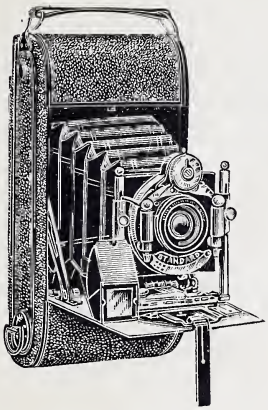
P.S.—For description of Prize Camera, see p. xi., *The Practical Photographer*, No. 6.

Index to Advertisers.

THE FINEST RANGE OF

HIGH-CLASS HAND CAMERAS

THE "STANDARD"



WITH GOERZ LENS,

£8 . 17 . 6.

suitable for Beginners or Experts is held by

The London Stereoscopic Company.

OUR TWO NEW MODELS....

The ¼-plate

STANDARD CAMERA

&

The ¼-plate

TROPICAL CAMERA

for the 1904 Season

are now ready.

WRITE FOR PARTICULARS TO...

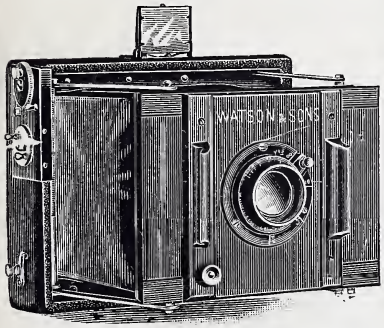
WEST END AGENTS FOR GOERZ SPECIALITIES.

106 & 108, Regent St., W., and 54, Cheapside, E.C.

Sole London Agents for Clyde Motor Cycles.

Watson's "VRIL" ♣♣

Focal Plane Camera.



An ideal Hand Camera, possessing **unique** advantages for all high-speed work, as well as for street scenes, landscape, and general photography.

Time and Instantaneous Focal Plane Shutter, giving comprehensive range of speeds from 1/5th of a second **(slow enough for general work)** up to 1/1000th of a second **(fast enough for anything).**
The speeds are adjusted from the outside.

The lens supplied is a "Holostigmat" convertible, giving perfect definition at full aperture *f*/6·1.

PRICE—with 3 Slides and Lens:

¼-plate.	5 × 4.	¼-plate. Stereoscopic
£11.	**£12.**	**£15. £20.**

Watson's New "ARGUS"

Focal Plane Reflex Camera.

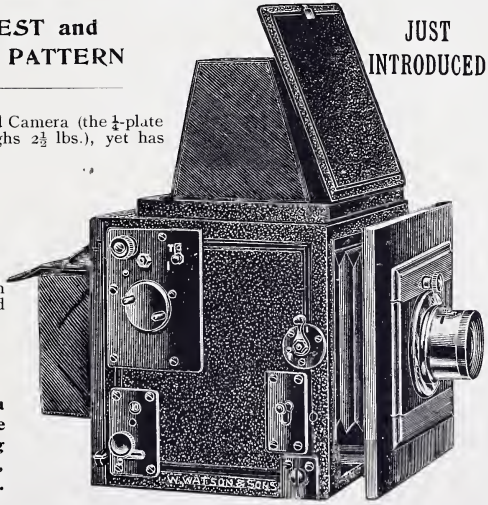
The SMALLEST, NEATEST and MOST EFFICIENT PATTERN made.

JUST INTRODUCED

No bigger than an ordinary Hand Camera (the ¼-plate measures only 6 × 6 × 4, and weighs 2½ lbs.), yet has **full-sized** focussing finder.

SURFACE SILVERED MIRROR, giving absolutely true reflection.

Speeds of Shutter 1/5th to 1/1000th of a second, and Time. All adjusted from the outside.



UNIQUE FEATURE.

When the Camera is used on a Stand for Time Exposures, the Reflex Finder and Focussing Adjustment are still available, dispensing with focussing cloth.

PRICE—fitted with Holostigmat Lens, and including 3 Slides	¼-plate. **£14 14 0**	5 × 4. **£15 10 0**

Descriptive Pamphlets free on application to

W. WATSON & SONS, 313, High Holborn, London, W.C.;

and 16, FORREST ROAD, EDINBURGH.

The "Nature" Series of Mounts.

The system of mounting on stout paper instead of cardboard is fast gaining ground on account of its manifold advantages, viz.: smaller space occupied, greater ease in storing, with less wear and tear, infinite variety possible, and more tasteful appearance of the photographs. 'Nature' Papers are admirably adapted for the new American System of mounting, for passe-partouts, etc. Two thicknesses can be obtained. In order to mount without cockling, use very stiff paste, spread sparingly, roll well with squeegee, and place under a board or book. These papers may be had in the sheet or in cut sizes. Prices below. Portfolios for holding prints mounted on cut sizes are made. See price list below.

In 1/0 Packets.

To take sizes up to ¼-plate.

Ordinary Thickness. No.	Contains sheets 8×6 in.		Extra Thick Series. No.	Contains sheets 8×6 in.
A	48	assorted colours	A0	32
A1	48	grosvenor green	A01	32
A2	48	duffel gray	A02	32
A3	48	gray bark	A03	32
A4	48	playfield cream	A04	32
A5	48	rough white	A05	32
A6	48	dove	A06	32
A7	48	deep sea blue	A07	32
A8	48	autumn brown	A08	32
A9	48	smoke gray	A09	32
A10	48	fern green	A010	32
A11	48	coffee	A011	32
A12	48	wine red	A012	32
A13	48	black	A013	32
A14	48	olive green	A014	32
A15	48	iron gray	A015	32
A16	48	russet	A016	32

To take sizes up to ½-plate.

Ordinary Thickness. No.	Contains sheets 10×8 in.		Extra Thick Series. No.	Contains sheets 10×8 in.
B	36	assorted colours	B0	24
B1	36	grosvenor green	B01	24
B2	36	duffel gray	B02	24
B3	36	gray bark	B03	24
B4	36	playfield cream	B04	24
B5	36	rough white	B05	24
B6	36	dove	B06	24
B7	36	deep sea blue	B07	24
B8	36	autumn brown	B08	24
B9	36	smoke gray	B09	24
B10	36	fern green	B010	24
B11	36	coffee	B011	24
B12	36	wine red	B012	24
B13	36	black	B013	24
B14	36	olive green	B014	24
B15	36	iron gray	B015	24
B16	36	russet	B016	24

To take sizes up to ¼-plate.

Ordinary Thickness. No.	Contains sheets 12×10 in.		Extra Thick Series. No.	Contains sheets 12×10 in.
C	24	assorted colours	C0	16
C1	24	grosvenor green	C01	16
C2	24	duffel gray	C02	16
C3	24	gray bark	C03	16
C4	24	playfield cream	C04	16
C5	24	rough white	C05	16
C6	24	dove	C06	16
C7	24	deep sea blue	C07	16
C8	24	autumn brown	C08	16

To take sizes up to ½-plate.

Ordinary Thickness. No.	Contains sheets 12×10 in.		Extra Thick Series. No.	Contains sheets 12×10 in.
C9	24	smoke gray	C09	16
C10	24	fern green	C010	16
C11	24	coffee	C011	16
C12	24	wine red	C012	16
C13	24	black	C013	16
C14	24	olive green	C014	16
C15	24	iron gray	C015	16
C16	24	russet	C016	16

The Ordinary Papers are also supplied in large sheets (28×26 in.), price **2/6** per quire.
The Extra Thick Papers are also supplied in large sheets (28×26 in.), at **3/6** per quire of 24 sheets.

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Full-sized view ght way up, hori- ntally and vertic- lly, is focussed and en right up to ioment of exposing.

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Raising of surface orked and surface ilvered mirror is ab- olutely smooth and ilent; is in ONE IECE; Hood autom- tically folds and sets tself.

The Adams Re- olving Back is fitted o plate can be hanged from hori- zontal to vertical in a moment. Neither need the plate be covered before doing so. We were the original designers, of his movement.

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Do. do. do. Series V., 5", *f*/8 ..	7	5	0
Do. do. Goerz Lens, No. 0, III., *f*/6·8..	9	0	0
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Do. do. Busch Detective Aplanat, *f*/6..	5	5	0
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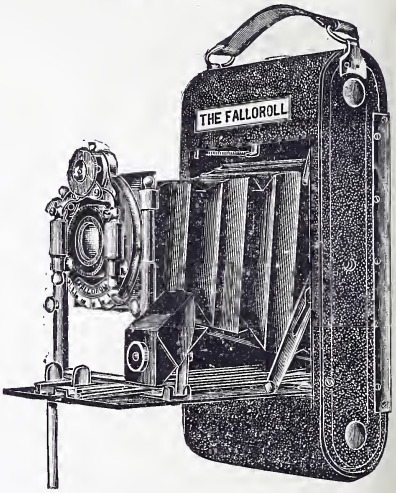

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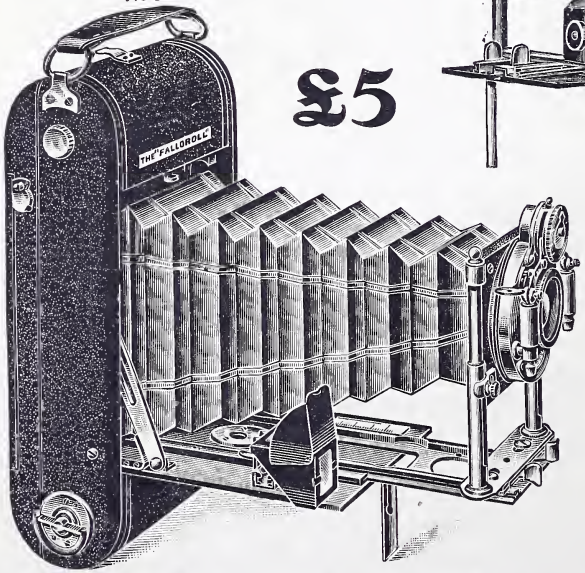

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