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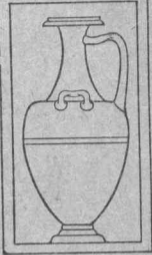
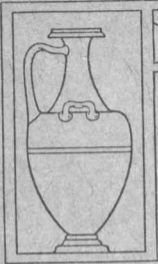
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'WELLOOME'

PHOTOGRAPHIC EXPOSURE CALCULATOR

HANDBOOK AND DIARY 1934



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THE FRENCH LINER
"L'ATLANTIQUE"
ON FIRE AT SEA

JANUARY, 1933

Reproduced from a
bromide print
toned with
'TABLOID'
BLUE TONER
and stained
with
'SOLOID' RED
and
YELLOW STAINS

Press Photograph, "Daily Mirror" (London)

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THE DUCKS

Negative and print
developed with
'TABLOID' 'RYTOL'
Bromide print
toned with
'TABLOID' SEPIA
TONER
'TABLOID' BLUE
and
GREEN TONERS
Stained with
'SOLOID'
YELLOW STAIN



General Trade Mark

This Handbook is an up-to-date and reliable guide to the actual practice of Photography and designed to assist the Photographer at every stage of his work.

The Publishers are always willing to assist registered purchasers in overcoming the difficulties they encounter in the course of their photographic activities (*see pages 213 and 235*).

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certain no light can reach the plate. Then turn on the light, and gently rock the dish until the time of development is up. Again turn out the light and place the plate in the fixing bath.

NOTE.—If working with a ruby light, it is not necessary to turn this out as directed, except when using panchromatic plates. The directions given above are for use when working with an ordinary white light or with panchromatic plates. Even if working with a ruby light it is needless to examine plates or films during development. Keep the dish covered and so avoid risk of fogging from undue exposure to red light.

When using flat films, proceed as for plates; but, if using roll films, unroll the film and detach the entire strip from the backing paper. Holding one end in each hand, pass the film through a dish of clean water. When it is thoroughly wet, and is free from air bubbles, it is ready for development, which is carried out in a ruby light, or in the case of panchromatic films in the dark, or by special safe light, by passing it to and fro through the developer in an ordinary dish. If the negatives vary in density, do not attempt to cut them up. The difference can be set right in the printing.

TANK DEVELOPMENT

This method of developing is the most popular and the simplest. For roll-films no dark-room is necessary; for plates or film-packs it is only necessary to load the tank in the dark, the remaining operations being carried out in the light.

Unnecessary handling is avoided and the risk of mechanical injury greatly diminished. The process is similar to dish development, except that the films or plates are loaded into a tank and, owing to the capacity of a developing tank, it is generally more convenient and economical to use a somewhat more dilute developing solution. The principle of time development in a tank is precisely the same as in a dish.

Ascertain the capacity of the tank by referring to *page 23*, or if the capacity is not given in the list and the makers do not give the fluid capacity in their directions, fill the tank to the prescribed mark with plain water and measure the quantity. Then load the tank with films or plates in accordance with the instructions issued by the maker, make up the required quantity of solution and pour into the tank. It is advisable in most cases to agitate the tank while allowing the developer to act for

the time given in the Table on *pages 19-22*. This is necessary to ensure even development and to avoid air bubbles.

When development is complete, pour off the developer and rinse the tank thoroughly three or four times with clean water; this makes it possible to remove the film or plate in subdued light to the fixing bath. By adding 'TABLOID' DESENSITISER to the developing solution, all risk of fogging while removing the negatives from the tank to the fixing bath in a lighted room will be obviated (*see page 31*).

Two developers issued by Burroughs Wellcome & Co. are particularly suited for tank development.

'RYTOL,' an ideal developer for tank use. Its chief characteristic is that it gives beautiful soft, well-graded negatives, particularly suitable for printing on gaslight paper, and for enlarging by the ordinary artificial light available for amateurs. Many prominent workers consider 'TABLOID' 'RYTOL' the ideal developer for pictorial work, and whenever it is desired to retain all the most delicate gradations of the subject.

'TANCOL' is the most suitable developer of the "pyro" type for tank use. It brings out all available detail, is admirably adapted for snapshots, because it is so adjusted that although it contains no restrainer to slow the plate, it does not cause fog, even when dealing with rapid films. A 'TANCOL' negative possesses that good printing quality which has become known as "pyro quality."

Should there be any tendency to fog owing to over-exposure, use of stale plates, etc., potassium bromide should be added, and the time of development increased.

Dissolve one 'Tabloid' Potassium Bromide, gr. 1, in $\frac{1}{2}$ oz. of water and add quarter to half of this solution to each 'Tabloid' Accelerator. This will be found sufficient, except in extreme cases. Such addition is not generally necessary. (*See also direction for Restrainers, page 54.*)

Tank Tables.—Special Tables, showing times to develop when using 'Rytol' and 'Tancol' at various dilutions in the tank, are given on *pages 19-22*.

Select a dilution which gives a suitable number of ounces for the tank to be employed. The strengths most recommended for general use are those marked with an asterisk.

TIME TABLES FOR
DEVELOPMENT

These tables have been worked out by careful scientific experiment, and produce negatives of average contrast.

The times given in the tables may be increased or decreased to suit individual requirements if pluckier or weaker negatives are required.

Remember that the length of the exposure governs the *density* of the negative; the length of development governs *contrast*.

If the negatives are too thin, the cause is under-exposure; if too dense, the cause is over-exposure. If the negatives yield flat prints, development has been too short for the printing process; if the prints are too contrasty, development has been too long.

The times given in the tables are for—

- Plates and films marked N in Table B, pages 204 to 210.

For all plates or films marked

A—Increase the time by one-half.

B—Double the time.

C—Decrease the time by one-third.

D—Halve the time.

Special Note.—Film-packs should be developed at least 25 per cent. longer than time table indicates.

- Negatives suitable for printing on normal gaslight paper or enlarging by weak artificial light.

For bromide paper, chloro-bromide papers and enlarging by arc light or day light, it may be advisable to increase the time of development by one-half.

- Subjects of ordinary contrast, such as portraits and groups, landscape and street scenes.

For very flat or dull subjects, increase the time of development by one-quarter.

For strong contrast subjects, such as interiors, indoor portraits, etc., decrease the time of development by one-quarter.

TIME AND TEMPERATURE TABLE

DEVELOPERS	45° F. 7° C.	50° F. 10° C.	55° F. 13° C.	60° F. 15.5° C.	65° F. 18.5° C.	70° F. 21° C.	75° F. 24° C.
	mins.	mins.	mins.	mins.	mins.	mins.	mins.
'TABLOID', 'RYTOL', Normal strength	8½	7	6	5	4½	3½	3
Half normal strength (8 ounces of water to each pair of products)	21	18	15	13	11	9	7½
One-third normal strength (12 ounces of water to each pair of products)	34	28	24	20	17	14	11½
'TABLOID', 'TANCOL', Double strength (2 ounces of water to each pair of products)	8½	7	6	5	4½	3½	3
Normal strength (4 ounces of water to each pair of products)	17	14	12	10	9	7	6
Half normal strength (8 ounces of water to each pair of products)	34	28	24	20	18	14	12

N.B.—This Table is for plates or films classified N. For variations, see notes on page 16
When developing film-packs, increase the above times by 25 per cent.

TIME AND TEMPERATURE TABLE (CONTINUED)

DEVELOPERS	45° F. 7° C.	50° F. 10° C.	55° F. 13° C.	60° F. 15.5° C.	65° F. 18.5° C.	70° F. 21° C.	75° F. 24° C.
	mins.	mins.	mins.	mins.	mins.	mins.	mins.
'TABLEOID' METOL-QUINOL Normal strength Half normal strength (4 ounces of water to each pair of products) One-third normal strength (6 ounces of water to each pair of products)	5½	4½	3¾	3	2½	2	1¾
	7	6	5	4½	3½	3	2½
	9½	7¾	6½	5½	4½	4	3½
'TABLEOID' PYRO-METOL 'TABLEOID' PYRO-SODA 'TABLEOID' AMIDOL 'TABLEOID' HYDROQUINONE 'TABLEOID' METOL	3	2½	2	1½	1¼	1	¾
	8	6½	5½	4½	3¾	3	2½
	7½	6	5	4	3½	2¾	2¼
	5½	4½	3¾	2¾	2¼	1¾	1¼
	10¾	9½	7¾	6½	5½	4½	3¾

N.B.—This Table is for plates or films classified N. For variations, see notes on page 16
When developing film-packs, increase the above times by 25 per cent.

TANK TABLE FOR 'TABLEOID' 'RYTOL' UNIVERSAL DEVELOPER

NUMBER OF PRODUCTS	45° F. 7° C.		50° F. 10° C.		55° F. 13° C.		60° F. 15.5° C.		65° F. 18.5° C.		70° F. 21° C.		75° F. 24° C.	
	mins.	mins.	mins.	mins.	mins.	mins.	mins.	mins.	mins.	mins.	mins.	mins.	mins.	mins.
One pair in 4 ounces of water Two pairs,, 8 Three ,, 12 or Four pairs in 16 ounces of water	Class N	8½	7	6	5	4½	4	3½	3	2½	2	1½	1¼	1
	Class A	12¾	10½	9	7½	6¾	6	5½	5	4½	4	3½	3	2½
	Class B	17	14	12	10	9	7	6	5	4	3	2½	2	1½
One pair in 5 ounces of water Two pairs,, 10 Three ,, 15 or Four pairs in 20 ounces of water	Class N	12	10	8½	7	6	5	4	3	2½	2	1½	1¼	1
	Class A	18	15	12¾	10½	9	7½	6	5	4	3	2½	2	1½
	Class B	24	20	17	14	12	10	8	7	6	5	4	3	2½
*One pair in 6 ounces of water *Two pairs,, 12 *Three ,, 18 or *Four pairs in 24 ounces of water	Class N	14	12	10	9	7½	6	5	4	3	2½	2	1½	1¼
	Class A	21	18	15	13½	11½	10	8	7	6	5	4	3	2½
	Class B	28	24	20	18	15	12	10	8	7	6	5	4	3

† For classification of plates or films, see Table B, pages 204-210

The times may be increased or decreased if pluckier or weaker negatives are required
When developing film-packs, increase the above times by 25 per cent.

TANK TABLE FOR 'TABLOID' 'RYTOL' UNIVERSAL DEVELOPER (CONTINUED)

NUMBER OF PRODUCTS	†Classification of Plate or Film		50° F.	55° F.	60° F.	65° F.	70° F.	75° F.
			10° C.	13° C.	15.5° C.	18.5° C.	21° C.	24° C.
*One pair in 8 ounces of water	Class N	mins.	21	18	13	11	9	7½
*Two pairs, 16 " " "	Class A	mins.	31½	27	19½	16½	13½	11½
*Three " " " "	Class B	mins.	42	36	26	22	18	15
*Four pairs in 82 ounces of water	Class N	mins.	27½	23½	19½	16½	14	11½
One pair in 10 ounces of water	Class A	mins.	41½	35½	24½	21	17½	14½
Two pairs, 20 " " "	Class B	mins.	55	47	33	28	23	19
Three " " " "	Class N	mins.	34	28	24	20	17	14
Four pairs in 40 ounces of water	Class A	mins.	51	42	36	30	25½	21
One pair in 12 ounces of water	Class B	mins.	68	56	48	40	34	28
Two pairs, 24 " " "	Class N	mins.	27	23	19	16	14	11½
Three " " " "	Class A	mins.	36	30	25	21	17½	14½
Four pairs in 48 ounces of water	Class B	mins.	48	40	34	28	23	19

† For classification of plates or films, see Table B, *Pages 204-210*

The times may be increased or decreased if pluckier or weaker negatives are required
When developing film-packs, increase the above times by 25 per cent.

TANK TABLE FOR 'TABLOID' 'TANCOL' DEVELOPER

NUMBER OF PRODUCTS	†Classification of Plate or Film		50° F.	55° F.	60° F.	65° F.	70° F.	75° F.
			10° C.	13° C.	15.5° C.	18.5° C.	21° C.	24° C.
One pair in 2 ounces of water	Class N	mins.	8½	7	5	4½	3½	3
Two pairs, 4 " " "	Class A	mins.	12½	10½	7½	6½	5½	4½
Three " " " "	Class B	mins.	17	14	12	10	7	6
Four pairs in 8 ounces of water	Class N	mins.	17	14	12	10	7	6
*One pair in 4 ounces of water	Class A	mins.	25½	21	18	15	13½	10½
*Two pairs, 8 " " "	Class B	mins.	34	28	24	20	18	14
*Three " " " "	Class N	mins.	21	18	15	12	11	9
*Four pairs in 16 ounces of water	Class A	mins.	27	23	19	16	13½	11½
One pair in 5 ounces of water	Class B	mins.	42	36	30	24	22	18
*Two pairs, 10 " " "	Class N	mins.	21	18	15	12	9	7½
*Three " " " "	Class A	mins.	31½	27	22½	18	16½	13½
*Four pairs in 20 ounces of water	Class B	mins.	42	36	30	24	22	18

† For classification of plates or films, see Table B, *Pages 204-210*

The times may be increased or decreased if pluckier or weaker negatives are required
When developing film-packs, increase the above times by 25 per cent.

Mix the developer according to instructions; set up a watch or clock in the dark room so that it can be seen easily. Place the plate or film in the dish. When the hand of the watch or clock touches an even minute, flow the solution quickly, but steadily and evenly, over the plate. Now begin to count seconds, and rock the dish gently. Note the number of seconds which elapse before the first sign of an image appears. Multiply this number by the factor for the developer in use, and you get the total time to continue development. Factors for 'Tabloid' Developers are given in the table below.

NOTE.—By desensitising before developing, a bright light can be used for inspecting the plate (see page 31).

These factors may be altered to suit individual requirements. Decreasing the factor lessens contrast; increasing it, increases contrast.

This method is covered by the patent of the discoverer, Mr. Alfred Watkins, of Hereford (Eng.), who, however, gives free permission for the use of his system with an ordinary watch only.

Example.—The image appears in 25 seconds with 'Rytol' Developer. The total development must be twelve times this—300 seconds, or five minutes from pouring on the developer.

NOTE:—If subjects contain no sky, develop for two-thirds of indicated time only:

- A.—For cloud negatives, snow scenes, portraits and very light objects, negatives for enlarging or printing on contrasty gaslight paper and gum printing. B.—For bromide, soft gaslight, chlorobromide, P.O.P. and platinotype printing. C.—For carbon printing and copy negatives of black-and-white subjects.

FINE GRAIN NEGATIVES

As it is often desirable to make big enlargements from miniature hand camera or cinema film, the grain of the negatives should be kept as fine as possible and every precaution taken to avoid scratching the negative or damaging it in any manner.

The production of a fine grain depends more upon the method of procedure than upon the developer. If the following points are carefully attended to, no difficulty should be experienced in producing negatives that will be perfectly satisfactory from the point of view of grain and freedom from blemishes:—

- (1) Exposure should always be on the full side. Under-exposure will cause graininess whatever precautions are adopted.
- (2) Development should not be forced. The negatives should be developed according to the time indicated in the table on pages 19-22.

The most suitable developers are 'TABLOID' BRAND 'RYTOL' and 'TABLOID' BRAND 'TANCOL'. 'RYTOL' should be used preferably in the strength of one pair of products in six ounces of water or one pair in eight ounces; 'TANCOL' should be used in the strength of one pair of products in four to six ounces of water. The temperature of the developer should be preferably 60° to 65°.

When using film tanks which have celluloid aprons, occasionally the paper backing may stick to the film. If this occurs, it is probable that, on drying, the parts affected will show a peculiar granularity which, when sufficiently enlarged, will spoil the picture. Therefore, it is essential to make sure that if the backing paper is left on it does not stick to the film, by continually agitating the tank.

Developers	A	B	C
	For Soft Contrast	For Normal Contrast	For Strong Contrast
	(See note, page 25)		
'Tabloid' 'Rytol'			
Normal strength ..	10	12	15
Half normal strength	12	14	18
One-third normal strength	14	17	22
'Tabloid' 'Tancol'			
Normal strength ..	10	12	15
Double strength ..	8	10	12
'Tabloid' Amidol			
Normal strength ..	7	10	12
Half normal strength	10	12	15
'Tabloid' Hydroquinone	3	4½	5
'Tabloid' Metol ..	20	30	35
'Tabloid' Metol-Quinol	10	12	15
'Tabloid' Pyro-Soda	4	6	7
'Tabloid' Pyro-Metol	6	9	11

Fixing should be done in a fresh acid hypo bath (see page 30). Never use stale fixing baths: a fresh bath for each film costs little and is much safer.

After fixing, the films should be washed in running water for at least 45 minutes. The flow of water should not be violent, but only of sufficient strength to ensure that the films are thoroughly washed. If any doubt exists, the time of washing should be increased. After washing, sponge the negative carefully with a wad of pure cotton wool or a piece of soft chamois leather soaked in a five per cent. solution of hydrochloric or acetic acid. Tears of water should be removed, as they cause drying marks.

Finally, the films should be dried in an atmosphere free from dust. The drying should not be prolonged, and yet should not be hurried. Drying in an atmosphere free from dust is very important, because dust which has become embedded in the gelatine during drying will be reproduced as a mass of white spots on enlargements.

DEVELOPMENT OF CINÉ FILMS

The processing of ciné films of the direct reversal type should be carried out according to the instructions issued with the make of film used.

Negative film from which a positive film is to be printed can be processed quite easily in the following manner, using a tank or one of the special frames necessary for carrying through the work.

The developer recommended is 'TABLOID' BRAND 'RYTOL,' and the strengths for general use are those marked with an asterisk on pages 19 and 20, although other strengths may be used if found preferable.

After development, the film should be fixed in an acid fixing bath and washed in the usual manner. When dry the celluloid side of the film is cleaned from finger-marks or smudges by the use of cotton wool or chamois leather slightly moistened with methylated spirit.

The film may be intensified or reduced, if necessary, after development, by the methods indicated on page 33.

The positive film may be exposed through the camera or by means of one of the printing machines for this purpose. When exposed, the following developer is advised:—

'Tabloid' 'Rytol'	One
'Tabloid' 'Rytol' Accelerator	One
Water	Four ounces

Some workers prefer a developer that produces more contrast, and in this case one of the following is suggested, according to the degree of contrast required:—

'Tabloid' Metol-Quinol	One
'Tabloid' Metol-Quinol Accelerator	One
Water	One ounce

or

'Tabloid' Hydroquinone	One
'Tabloid' Hydroquinone Accelerator	One
Water	One ounce

The time of development is ascertained by examination, as in the case of prints. If correctly developed, the picture when viewed from the surface should seem a shade too dark, with the unexposed margins remaining white. Looking through the outer strand of film, full details should be visible in all parts and the shadows be a trifle dense. When development is considered complete the film should be rinsed, fixed, washed, dried and cleaned as in the case of the negative.

If desired, the positive film may be toned or stained; full details will be found on pages 48-54, 58.

DEVELOPERS

'Tabloid' 'Rytol' Universal Developer

This Developer, originated by Burroughs Wellcome & Co., is designed for universal use. It gives a soft, well-graded negative of moderate density, admirably adapted for printing by artificial light or for enlarging. It is the developer which has been chosen by the official photographers of all the most important Expeditions of modern times.

For dish development:—

'Tabloid' 'Rytol'	One
'Tabloid' 'Rytol' Accelerator	One
Water	Four ounces

Drop the 'Tabloid' products into the water, immediately crush them into powder with a glass or other rod, and stir. Solution takes place quickly.

The normal solution under normal conditions will produce a negative of average density in five minutes. If quicker development is required, use two ounces of water instead of four, and develop for half the time.

For tank development, use six to 12 ounces of water instead of four ounces as above (see Tank Table, pages 19 and 20).

(See also Bromide and Gaslight Papers)

'Tabloid'
'Tancol' Developer

This developer yields a negative of the pyro type, warm black or slightly yellow in colour, giving good contrast in printing, and is especially suitable for use when bright, plucky prints are wanted.

It is admirably adapted for snapshots, because, although it contains no restrainer, it does not require the addition of bromide to prevent fog.

For dish development:—

'Tabloid' 'Tancol' Accelerator ..	One
Water	Two ounces
'Tabloid' 'Tancol'	One

Dissolve in order given, making sure that the accelerator is dissolved before the 'Tancol' product is added.

Under normal conditions development takes four to five minutes. Rinse, fix and wash as usual (*see page 30*). (For Tank Development, *see pages 21-22*. For Time Tables for 'Tancol' in dish, *see page 17*).

'Tabloid'
Pyro-Soda Developer
(*Ilford Formula*)

'Tabloid' Soda Compound	One
Water	One ounce
'Tabloid' Pyrogallic Acid	One

Dissolve in the order given. Development under normal conditions takes about four minutes (*see Table, page 18*). This developer may be used for plates and films of any make.

'Tabloid'
Pyro-Metol Developer
(*Imperial Standard Formula*)

The working solution is prepared as follows:—

'Tabloid' Pyro-Metol Compound ..	One
Water	One ounce
'Tabloid' Pyro-Metol Accelerator ..	One

Dissolve in the order given.

This developer gives negatives which tend to have a distinctly yellow colour. If less colour be desired, add one or two 'Tabloid' Sodium Sulphite to each ounce of solution.

Normal time for development, 1½ minutes (*see Table, page 18*). For slower development, dilute with an equal volume of water and develop for double the time.

'Tabloid'
Hydroquinone Developer

Specially recommended when contrast is required, copying from flat originals, line drawings and printed matter.

The working solution is made as follows:—

'Tabloid' Hydroquinone	One
Water	One ounce
'Tabloid' Hydroquinone Accelerator ..	One

In cold weather hydroquinone dissolves slowly and acts slowly. Care must be taken, therefore, to ensure complete solution and to develop in accordance with the time given in the table on *page 18*, according to the temperature prevailing.

'Tabloid'
Metol-Quinol Developer

Suitable for plates, films and development papers, *see pages 39 and 41*.

'Tabloid' Metol-Quinol	One
Water	Two ounces
'Tabloid' Metol-Quinol Accelerator ..	One

Time for development, about three minutes.

For slower development, or when it is desired to develop a number of plates in one dish, use four ounces of water instead of two and develop according to time table on *page 18*.

'Tabloid'
Amidol Developer

Suitable for plates, films and development papers, *see pages 39 and 41*. Less liable than ordinary developers to cause frilling when the temperature is high, as in summer time or warm climates.

The working solution is made thus:—

'Tabloid' Amidol Accelerator	One
Water	One ounce
'Tabloid' Amidol	One

Amidol will not keep in solution, so that the 'Tabloid' products are particularly convenient.

Time for development under normal conditions, 4 minutes (*see page 18*).

'Tabloid'
Metol Developer

'Tabloid' Metol	One
Water	One ounce
'Tabloid' Metol Accelerator	One

Dissolve in the order given. Normally, development takes about six minutes (*see page 18*).

FIXING AND WASHING NEGATIVES

After development, negatives must be fixed by immersion in a 20 per cent. Hypo solution, *i.e.*, Hypo four ounces, water 20 ounces, or in an acid fixing bath in which $\frac{1}{2}$ ounce of Potassium Metabisulphite is added to the 20 ounces ordinary bath.

The acid bath is to be preferred, especially for films. Ordinary baths become stained, whereas acid baths remain clear and tend to give cleaner negatives.

Fixing takes at least 10 minutes at 60° F.; longer if temperature be lower.

The following will be found useful for trial plates or on tour:—

Normal Fixing Bath.—Two 'Tabloid' Hypo in each ounce of water.

Acid Fixing Bath.—Add one 'Tabloid' Potassium Metabisulphite to each ounce of normal bath.

After fixing, wash the negatives in running water, preferably in a proper washing trough for from half to one hour, after which wipe the surface with a pledget of cotton wool and place to dry.

CAUSES OF FAULTY NEGATIVES

Very thin negatives.—All detail visible, but too thin to print well, the cause is under-development and the negative should be intensified (*see page 33*). Detail not visible, under-exposure is the cause of the defect.

Very dense negatives.—Caused by over-exposure or over-development; may be much improved by reduction (*see page 35*).

Excessive contrast.—Caused by under-exposure and over-development; may be improved by reduction (*see page 35*).

Fogging.—Usually caused by stray light. If rebate marks are clear, fogging has occurred in the camera; if the whole plate is fogged, it occurred outside the camera. Can often be cleared by 'Tabloid' Potassium Ferricyanide Reducer (*see page 35*).

Clear Spots.—Small "pin-holes" are usually caused by dust preventing light or developer working at these points. Larger spots are the result of air bubbles forming during development.

Black Specks.—Usually due to undissolved particles of developer settling on the emulsion. No remedy for these faults.

Image Blurred.—Due to (1) Shaking camera (while exposing); (2) Movement of subject; (3) Imperfect focus. No remedy for these faults.

Uneven Density.—Caused by uneven flow of developer or, more rarely, to rapid change of temperature during drying. No remedy for the defect.

DEVELOPMENT IN A BRIGHT LIGHT

Plates and films can be developed under conditions similar to gaslight prints by employing 'TABLOID' DESENSITISER.

First Method.—Take sufficient water to cover the plate in an ordinary developing dish. In each ounce of this water dissolve one 'Tabloid' Desensitiser. Transfer plate to this solution in darkness, or, if preferred, ruby light (*see * below*). After one minute, transfer plate to developing solution and complete development by candle light or shaded gas or electric light. The solution can be used over and over again if stored in the dark. This method is the one to be used by those who develop by the factorial method. It greatly facilitates the detection of the first signs of the image.

Second Method.—Dissolve one 'Tabloid' Desensitiser in each four ounces of developing solution and place the plate into this solution in the dark, or, if preferred, by ruby light (*see * below*), for four minutes and then complete development by candle light, shaded gas or electric light. For tank development, one product in each six or eight ounces of developing solution may be used. This method is most suitable for use with 'Tabloid' 'Rytol' and 'Tabloid' 'Tancol' Developers.

FIXING.—Fix and wash in the usual way.

With ultra rapid and highly-sensitised colour plates it is wiser to keep the dish covered with a piece of card except for those brief periods necessary to inspect it or to remove it to the fixing bath.

* Panchromatic plates must be inserted in the solution in absolute darkness and development finished by yellow light and not by red light (a red light will destroy the latent image), naked candle light or gaslight.

Time of development is not modified except with formulæ containing metol (slightly) and with anidol (greatly), and for this reason such developers should be avoided. Using 'Rytol' or 'Tancol', times for development are as given in the table on *page 17*.

Note.—By nature chemicals which act as desensitisers are inclined to leave a small undissolved residue in some waters. Boiling for a few minutes will ensure complete solution or the cold solution may be filtered through cotton wool.

TROPICAL DEVELOPMENT

Use materials specially prepared and packed for use in the Tropics. Make exposures in the early morning or use a filter to cut out the haze due to the moist atmosphere. Develop in the early morning and as soon as possible after making the exposure. Keep the various solutions at an even temperature, so far as possible. It is better to work at room temperature than to use cooled water, unless it is possible to keep such water at a constant temperature.

If the above points are carefully watched and development carried out as follows, no difficulty should be experienced in obtaining satisfactory negatives.

Immerse the plate or film straight into the following developing solution and develop for the time indicated in the table below:—

'Tabloid' 'Rytol' Two products
'Tabloid' 'Rytol' Accelerator ... Two products
Solution of Sodium Sulphate ... Four ounces

*Classification of Plate or Film	80° F.	85° F.	90° F.
	27° C.	30° C.	32° C.
	mins.	mins.	mins.
Class N	3½	3½	3
Class A	5½	5	4½
Class B	7½	6½	6
Class C	2½	2½	2
Class D	2	1½	1½

* See pages 204-210

The solution of sodium sulphate is prepared by dissolving two ounces of the salt (commonly known as glauber salt) in each pint of water.

In certain cases the addition of two to five drops of a 10 per cent. solution of Potassium Bromide to the developer will help to prevent fog.

After development, rinse the negatives in clean water and transfer to the following hardening fixing bath:—

Hypo Two ounces
Sodium Sulphite Crystals One ounce
Formaline Solution (40 per cent.) ... One ounce
Water to make Ten ounces

It is of importance that these chemicals be dissolved in the order given.

After fixing, washing may be proceeded with without anxiety, providing care is taken to ensure that the temperature of the washing water is the same as that of the other solutions used in the processing.

The negatives may be washed in six or seven changes of water if running water is not to hand, and the washing completed when circumstances are more favourable. When possible, the negatives should be carefully wiped or dabbed with a wrung-out chamois leather.

INTENSIFICATION

Intensification will not add details but will strengthen them however weak they may be. Intensification of an under-exposed negative quite devoid of detail in the shadows does more harm than good.

Chromium Intensifier

'Tabloid' Chromium Intensifier is suitable for use with plates, films, lantern slides and bromide prints. In addition, it may be used with cine film, either negative or positive, and is specially indicated for use with positives prepared by the direct reversal method.

DIRECTION.—Dissolve one 'Tabloid' Chromium Intensifier in each two ounces of water. Immerse the plate, film or print in the solution and gently rock the dish until the image is fully bleached. Wash in running water until the yellow stain disappears or use 'Tabloid' Potassium Metabisulphite as indicated on page 55.

The bleached image is then re-developed with any developer. Develop fully to obtain the full effect of the process.

It is not necessary to re-fix after re-development, but a few minutes' washing is desirable.

If the surface of negative has been greasy or finger-marked, soak in a weak alkaline bath and then wash before intensifying.

Special Note.—To prevent staining, the following points should be noted:—

(a) Before treatment, negatives must be properly fixed and thoroughly washed to remove every trace of hypo.

(b) Intensification must be conducted in artificial white light or subdued daylight—not in full daylight.

If intensification is uneven, it is proof that the solutions were not allowed to act properly. Bad stains indicate the negative has not been properly fixed and washed before intensification.

TO DECREASE CONTRASTS in making bromide and gaslight prints or enlargements, especially in the case of enlargements, when the negative is hard and brilliant, proceed as follows:—

DIRECTION.—Increase the exposure from two to five times the normal. Dissolve one 'Tabloid' Chromium Intensifier in 16 or more ounces of water. After exposure and before development, immerse the print or enlarge-

ment in this solution for half-a-minute to a minute, then, still by the dark-room light, wash in several quick changes of water, develop and fix as usual.

Mercury Intensifier

'Tabloid' Mercuric Iodide and Sodium Sulphite Intensifier is the most reliable mercury intensifier, and is suitable for use with ciné negative films as well as plates and films. It should not be used, however, with direct reversal ciné films, for which 'Tabloid' Chromium Intensifier should be used. It has a great advantage over ordinary mercury intensifiers, because it increases the strength of the weakest deposits, and does not destroy delicate details in the shadows. It is also much safer than stock solutions, being easy to store in a secure place and easy to recognise because of its distinct shape and colour.

DIRECTION.—Dissolve one 'Tabloid' product in each ounce of water. Having soaked the negative in water, place it in the intensifier and rock gently. The image will gradually grow in strength, and may be examined from time to time by transmitted light. As soon as sufficient density is attained the plate should be removed from the dish and washed for a short time. If at this stage the intensification is found to be too great, it may be removed by immersing the plate in normal hypo solution. The plate should be washed for five minutes after intensification and then re-developed with any ordinary developer. A final washing for a few minutes completes the operation, the whole of which may be conducted in subdued daylight.

Sepia Toning as a Method of Intensification

Another useful method of intensification is by toning the image with 'Tabloid' Sepia Toner ('Tabloid' Bleaching Compound and 'Tabloid' Sulphiding Compound). In this case there is no increase in the density of the image, but its opacity or printing value is greatly improved.

DIRECTION.—Dissolve one 'Tabloid' Bleaching Compound in two ounces of water. In this solution immerse the plate until fully bleached. Wash in running water for 10 minutes and then immerse in a solution of one 'Tabloid' Sulphiding Compound in four ounces of water for a few minutes. Finally, wash for 10 minutes or longer. The image becomes brown in colour and has a greatly increased printing value. (See also 'Tabloid' Colour Plate Intensifier, page 61)

REDUCTION

(1) For over-exposed negatives which are dense and fogged, or for lantern slides which are veiled in the high lights, use 'TABLOID' POTASSIUM FERRICYANIDE. It is also useful for clearing the lines in negatives of black-and-white drawings, engravings, etc., and may be employed, before intensifying, to remove fog.

(2) Under-exposed negatives which have been over-developed and show too much contrast or halation may be improved by reduction with 'TABLOID' AMMONIUM PERSULPHATE.

Neither ammonium persulphate nor the ferricyanide reducer will keep in solution. They must be freshly prepared and used at once. The 'Tabloid' products, which keep perfectly, are, therefore, most reliable.

(3) For correctly-exposed but over-developed negatives, lantern slides or even bromide prints, use 'TABLOID' BLEACHING COMPOUND.

Reduction is best carried out in daylight, as the process requires careful watching.

Potassium Ferricyanide (Farmer) Reducer This Reducer increases contrast.

DIRECTION.—To make Farmer Solution for reducing and clearing over-dense or foggy negatives and for general use, dissolve one 'Tabloid' Potassium Ferricyanide in two ounces of plain 10 per cent. hypo solution (1 ounce hypo crystals, water 10 ounces, or 'Tabloid' Hypo 2, water 2 ounces).

Take the negative from the fixing bath (if the negative be dry, immerse it in the fixing bath for 10 minutes so that the hypo may permeate the film), place it in the reducing solution and rock gently. The great danger in using Farmer Reducer is that, as ordinarily made, it works so quickly as to be difficult to control; consequently, the negative is often spoiled by loss of detail. With the strength given on *page 35* the action is slow and well under control. If quick action is required, use two or three 'Tabloid' products instead of one. When sufficient reduction has taken place, remove quickly and rinse under the tap to prevent further action. A thorough washing of at least half an hour in running water should follow.

For clearing lantern slides and cleaning up the lines in negatives of black-and-white subjects which require the faint deposits removed without affecting the denser parts, soak the slide or negative in water for ten minutes and place in a solution made by dissolving one 'Tabloid' Potassium Ferricyanide in an ounce of plain 10 per cent. hypo solution. Watch carefully, and as soon as the whites are clear, rinse under the tap to stop further action and then wash thoroughly.

Ammonium Persulphate Reducer

This Reducer decreases contrast.

DIRECTION.—Dissolve one 'Tabloid' Ammonium Persulphate in one ounce of water (distilled, if available). The use of distilled water with Ammonium Persulphate prevents clouding of the solution during use and staining of the film.

Two to the ounce may be employed in extreme cases, but one in two ounces will be sufficient if only a slight modification of density be desired. Before reduction, the negative or positive should have a special washing for 15 minutes in running water to ensure even action of the Reducer. Directly the desired result is obtained the plate or print must be transferred, without washing, to a solution of sodium sulphite, which may be made

by dissolving two 'Tabloid' Sodium Sulphite in each ounce of water. After five minutes in this bath the plate should be immersed in a clean acid fixing bath and then well washed in the ordinary way.

Reduction by Bleaching and Re-developing

For this purpose use 'TABLOID' BLEACHING COMPOUND, which is one of the constituents of 'Tabloid' Sepia Toner, but which may be purchased separately.

DIRECTION.—For negatives and slides, dissolve one 'Tabloid' Bleaching Compound in two ounces of water; for bromide prints use four ounces. Soak in this solution until the image is fully bleached; wash well and then re-develop with a dilute developer. As soon as sufficient density is obtained, and, in the case of plates, whilst the white bleached image on the back still appears in the denser portions, remove from the developing solution and immerse in a fixing bath. Fix and wash for the usual periods. This method softens the high lights in negatives, and considerably reduces halation if present. A weak developer is used to allow of control in removing the plate at a suitable moment. As some experience is necessary to judge this, experiment with waste plates is recommended. If it be desired to clear surface fog and increase contrast, the plate or print should be immersed for a moment or two only in the bleaching solution, and immediately plunged in the fixing bath. Then wash as usual.

Mechanical Reduction

Mechanical reduction is useful for reducing local density. It is accomplished by rubbing down parts of a negative that are excessively dense with the aid of methylated spirit on cotton wool or Baskett's Reducer, applied with the finger-tips or wash leather. Baskett's Reducer is made by mixing the contents of a small tin of Globe metal polish, two ounces of common terebene, and two ounces of salad oil.

The many printing processes can be grouped under two general classes—"printing-out" papers, where the image is visible after printing, and "development" papers, which require a developing solution to make the image appear. The latter process is explained first.

GASLIGHT PRINTS

For the beginner, there is no more satisfactory process than the use of gaslight paper. The process is simple and easily mastered by adherence to given rules and formula. With gaslight paper, prints can be made in an ordinary room by gas or electric light. Prints are produced by exposing to artificial light with subsequent development, and fixing on the lines of producing a negative. The picture is not visible before being developed.

The principal manufacturers now issue three grades of gaslight papers, *i. e.*, "vigorous," "normal," and "soft." For flat negatives use the vigorous grade; for negatives possessing rather more contrast use the soft grade. For negatives of average contrast such as produced by 'TABLOID' 'RYTOL' or 'TANCOL' used in accordance with the time tables given on *pages 17 and 18*, the normal grade is most suitable. Different makes of paper and different sources of light vary so much that it is impossible to give definite instructions for exposure. The directions of the paper maker must form a basis of trial, remembering that doubling the distance from the light makes the exposure *four* times as long.

Useful tables will be found on *pages 43 and 44*.

Bear in mind that, though the paper is very much less sensitive than a plate, it should be protected by loading the printing frame in a shaded part of the room, and doing it as quickly as possible, not forgetting to return the unused sheets to the envelope.

A trial exposure should be made about 12 or 18 inches from the light, covering the frame with a piece of cardboard; move this to expose a quarter of the

picture for, say, 10 seconds, then shift it again so that half is open to the light for another 10 seconds, then three-quarters, then the whole, then promptly remove it from the light. One end of the sheet has thus been exposed for 40 seconds, the other 10, and the middle portions 20 and 30 respectively. In development we can see which is nearest to the correct exposure.

The most suitable developer is 'Rytol,' prepared as follows:—

*'Tabloid' 'Rytol'	One
'Tabloid' 'Rytol' Accelerator	One
Water	2½ ounces

but, if preferred, the following may be used with success:—

*'Tabloid' Metol-Quinol.. .. .	One
'Tabloid' Metol-Quinol Accelerator.. .. .	One
Water	One ounce

or—

*'Tabloid' Amidol	One
'Tabloid' Amidol Accelerator	One
Water	One ounce

The exposed paper is laid at the bottom of a tray, the paper still shielded from direct rays of light, and the developer poured over it as in developing a plate.

Development is very rapid, so that care is necessary to flood the paper evenly with developer. It is sometimes advisable to soak the paper in plain water for a few seconds, after exposure and before development.

If the object comes up very slowly and will not develop fully, the exposure has been too short; if, on the other hand, too much exposure has been given, the picture will flash up all at once and the white parts will have

* Some papers, especially in damp climates, through storage in damp places or possibly through age, will not give the best results unless one to five drops of 10% solution of Potassium Bromide ('Tabloid' Potassium Bromide, gr. 1; water, 10 minims) are added to the developer. Usually, however, no added bromide is necessary

a greyish tinge. When the right exposure is found, it will be seen that the picture develops to its proper strength and then action seems to stop. As soon as the print is fully developed, it is removed, rinsed in clean water and put in the fixing bath.

Do not overwork the developing solution. The process of developing not only uses up the active agent, but also contaminates the solution with chemicals set free during the action. The developer costs so little that it is poor economy to risk a print rather than use fresh solution.

It is advisable to use an acid fixing bath made by adding 'Tabloid' Potassium Metabisulphite, one to each ounce of hypo solution; it stops development immediately and prevents stains. If an acid bath is used, rinsing between development and fixing is not essential. After fixing for ten minutes, the prints are washed for an hour in running water, then drained and placed to dry.

NOTE.—Yellow stains on gaslight prints are usually due to one of two causes:—

- (1) Under-exposure, followed by an attempt to force out the image by prolonged development.
- (2) Allowing portions of the print to remain uncovered by solution in the fixing bath.

One advantage of gaslight printing is that different grades of paper are made to suit different kinds of negatives; thus counteracting the fault in the negative, which must be bad indeed if it will not yield a fairly good print on one of the grades of gaslight paper.

With 'Rytol' Developer it is possible to obtain prints ranging in colour from warm black to sepia on most makes of gaslight paper by adding bromide to the developer and increasing the exposure. This is dealt with on a card entitled "Colours on Gaslight Prints by Development," obtainable free of charge from Burroughs Wellcome & Co.

BROMIDE PRINTS

The manipulation of bromide paper is similar to that of gaslight paper, except that the operations must be carried out in a room with a yellow or orange safe light, and the developer is the same as for plates. Bromide paper requires a rather stronger negative than gaslight.

The Developers recommended for Bromide Prints are:

'Tabloid' 'Rytol'	One
'Tabloid' 'Rytol' Accelerator ..	One
Water	Four ounces
'Tabloid' Amidol Accelerator ..	One
Water	One ounce
'Tabloid' Amidol	One
'Tabloid' Metol-Quinol	One
Water	Two ounces
'Tabloid' Metol-Quinol Accelerator	One

Dissolve the constituents of each developer in the order given.

The factorial development of bromide papers is favoured by many workers, and the following factors are for use with the above developers:—

'Tabloid' 'Rytol' Developer ..	6
'Tabloid' Amidol Developer ..	10
'Tabloid' Metol-Quinol Developer ..	5

Important Note.—Bromide prints develop more slowly than gaslight prints. To obtain the best results, and certainly for all prints which it is intended to tone, the exposure must be so adjusted that development takes at least two minutes at normal temperatures, and the developing action practically stops when sufficient detail has been obtained in the high lights. A suitable negative, correct exposure, and full development are the secrets of good bromide prints.

The finished picture, whether on gaslight or bromide paper, should be a pure black and white; if the blacks are greenish or the whites grey, the exposure has probably been wrong or the paper is in a condition demanding the addition of a few drops of 10 per cent. bromide to the developer (*see footnote, page 39*).

CHLOROBROMIDE PRINTS

The use of chlorobromide paper enables the photographer to produce warm black tones by direct development. This class of paper is intermediate in speed between bromide and gaslight paper. The manipulation is straightforward and the paper possesses considerable latitude in exposure and development. The normal treatment gives prints which are a rich warm black in colour, but, by varying the strength of the developer, the temperature and the amount of bromide, it is possible to produce a range of colours from red chalk to cold brown. For normal development, the following developer will be found suitable for most papers:—

'Tabloid' 'Rytol'	One
'Tabloid' 'Rytol' Accelerator ...	One
'Tabloid' Potassium Bromide ...	Two
Water	Four ounces

The exposure with the average negative is approximately 6 to 10 seconds at a distance of 18 in. from a light of 50 c.p. and the time of development 3 to 4 minutes at a temperature of 65° F.

To produce colder tones, the temperature of the developer should be lowered and in certain cases the concentration increased.

Warmer tones are produced by dilution of developer, increasing the temperature of the developer and, in certain cases, the amount of bromide.

Increased exposure is required for the production of warmer tones, and this should be so graded that 3 to 4 minutes' development produces the required tone.

Do not over-expose and under-develop. The resultant print will be muddy and flat. The best results will be produced by correct exposure followed by 3 to 4 minutes' development, according to the tone required.

After development, the prints are fixed and washed in the usual manner, but care should be taken to see that the washing operation is thorough.

Prints made by this process can be toned or stained with 'Tabloid' Toners or 'Soloid' Stains.

TABLE FOR CONTACT PRINTING
BY ARTIFICIAL LIGHT

In making Bromide, Chlorobromide or Gaslight Prints, Lantern Slides, Transparencies, etc., the distance at which the printing frame is placed from the source of light materially affects the time of exposure. The exposure varies as the square of the distance. Thus, if the correct exposure at 1 ft. be 10 seconds, at 2 ft. it will be 40 seconds, and at 3 ft., 90 seconds.

A table is provided on page 44 which gives, approximately, relative exposures at different distances from the source of light.

It is best to have a standard distance from the light for printing from negatives of normal density. Dense negatives should be printed nearer to the light to attain a soft result; thin negatives should be printed farther from the light to get as plucky a print as possible.

The table may be used in two ways, thus:—

Example I.—If the exposure under given conditions be 20 seconds at 2 ft., what will it be at 4 ft.?

Find the figure 20 in the column headed 2 ft., then follow the line along to the right, and under the column headed 4 ft. will be found the number of seconds which is approximately correct at the distance, viz., 80.

Example II.—Supposing the exposure be 15 seconds at 2 ft., what is the exposure at 3 ft.?

The number 15 does not actually occur in the 2 ft. column. The nearest number is 16, and the corresponding exposure at 3 ft. is 36 seconds. This will be near enough in most cases, but if it be desired to be more exact, proceed as follows: Find the line on which the figure 1 occurs in the column headed 2 ft. and then multiply the exposure at 2 ft. by $2\frac{1}{2}$, which is the figure in the same line but in the 3 ft. column. This gives $15 \times 2\frac{1}{2} = 34$ seconds, approximately, as the correct exposure at 3 ft.

DISTANCE FROM LIGHT							
4 in.	6 in.	9 in.	12 in.	18 in.	2 ft.	3 ft.	4 ft.
RELATIVE EXPOSURES							
1/120	1/60	1/30	1/15	1/8	1/4	1/2	1
1/60	1/30	1/15	1/8	1/4	1/2	1	1-3/4
1/30	1/15	1/8	1/4	1/2	1	2-1/4	4
1/15	1/8	1/4	1/2	1	2	4-1/2	8
1/8	1/4	1/2	1	2-1/4	4	9	16
1/4	1/2	1	2	4-1/2	8	18	32
3/8	3/4	1-1/2	3	6-3/4	12	27	48
1/2	1	2	4	9	16	36	64
5/8	1-1/4	2-1/2	5	11-1/4	20	45	80
3/4	1-1/2	3	6	13-1/2	24	54	96
7/8	1-3/4	3-1/2	7	15-3/4	28	63	112
1	2	4	8	18	32	72	128
1-1/8	2-1/4	4-1/2	9	20-1/4	36	81	144
1-1/4	2-1/2	5	10	22-1/2	40	90	160

NOTE.—The figures in this table are relative only. They are to be read as SECONDS or MINUTES according to whether the known exposure is in seconds or minutes. If the exposure be in seconds, fractions may be disregarded.

By Daylight.—The fixed focus daylight enlarger is the simplest and least expensive apparatus for enlarging. The results are usually softer and not so prone to show the small blemishes of a negative as those made with a condenser enlarger. A bright day should be chosen when making exposures: the enlarger should be pointed to the light, care being exercised to prevent direct sunlight or dark shadows falling on the negative. This type of enlarger can be used only for enlargements of a fixed size.

Enlarging may also be carried out satisfactorily in daylight by means of an ordinary front focussing camera. The back of the camera in which the negative is placed is inserted into a cut-out made in a light-tight wooden shutter fitted to a window facing a good light. A white reflector hinged to the bottom of the cut-out helps to ensure even lighting. A piece of bromide paper is pinned on a board parallel to, and at a suitable distance from, the camera, and the exposure made in the darkened room.

Focussing is done by racking the camera bellows and the distance of the board from the lens decreased or increased to regulate the size of enlargement required.

By Artificial light.—The enlarging lantern must be operated in a dark room. The light is thrown through a condenser, the function of which is to concentrate the light evenly over the negative area, and then projected through the lens on to an easel upon which is pinned a sheet of bromide paper of suitable size.

This process has the advantage that the whole or selected portions of the negative may be enlarged—the illuminant is constant, enlarging can be carried out at any time, any size of enlargement can be made, and local control can be exercised during the exposure.

Negatives for enlarging by artificial light should be soft, well-graded and not too dense. A harsh contrasty negative is unsuitable.

Negatives such as those developed with 'TABLOID' 'RYTOL' or 'TABLOM' 'TANCOL' are admirably suited.

For very thin, flat negatives or in subjects requiring a greater degree of contrast, gaslight paper may be used in place of the bromide paper normally employed.

Development of enlargements is similar to that of bromide and gaslight prints.

HOW TO MAKE P.O.P. PRINTS

To make perfect prints on P.O.P. (printing-out paper) it is necessary to have a suitable negative.

If your negative is thin or lacking in contrast, do not attempt to print it on P.O.P., but use gaslight paper.

For daylight printing, shade is better than direct sunlight; only when negatives are very dense should they be printed in sunlight.

Print rather deeper than required in the finished photograph. The exact depth of printing varies with different papers and must be learnt by experience. Matt paper requires to be more fully printed than glossy paper.

Ordinary P.O.P. has either to be toned in a special toning solution before it is fixed, or toned and fixed in a combined bath. Self-Toning Paper requires fixing only in hypo solution.

Separate Toning and Fixing

'Tabloid' Gold Chloride with Sulphocyanide Compound.—This bath works well with all papers intended for sulphocyanide toning.

'Tabloid' Platinum Toning Compound.—Each product contains one-third of a grain of potassium chloroplatinite, with citric acid and sodium chloride. This bath is most suitable for matt-surfaced P.O.P. and for Collodi-Chloride Paper.

Combined Toning and Fixing

'Tabloid' Gold Chloride with Thiosulphate Compound.—This bath is for gold toning and fixing in one operation. It works well with all makes of P.O.P.

Immerse the prints in the mixed solutions, **without previous washing**, and tone from 7 to 10 minutes or more. Short toning gives warm brown; long toning, cold purples.

NOTE.—The 20 per cent. **Hypo Solution** is the stock solution of plain hypo (1 lb. in 80 ounces of water, or five 'Tabloid' Hypo in two-and-a-half ounces).

Self Toning P.O.P.

In this class of paper the necessary toning salts are incorporated in the emulsion. Transfer the prints to a fixing bath, with or without preliminary washing, according to the directions issued by the makers.

HOW TO MAKE LANTERN SLIDES

Lantern slides and transparencies are made by printing from the negative upon glass plates, prepared with an emulsion similar to that used on bromide and gaslight papers.

Lantern Plates of different speeds are available. Slow plates should be used for thin negatives or when a warm toned image is required. Slow plates have high numbers in the table on page 201.

Exposures may be made either by contact in a printing frame or by reduction in a lantern. The slide is then developed as if it were a bromide or gaslight print and fixed and washed like a negative. Any developer recommended on pages 39 and 41 for gaslight or bromide papers may be used, as well as 'Tabloid' Hydroquinone and 'Tabloid' Pyro-Soda.

The following are two selected Lantern Slide formulæ:—

Warm Black Tones—

'Tabloid' 'Rytol'..	..	..	One
'Tabloid' 'Rytol' Accelerator..	..	..	One
'Tabloid' Ammonium Bromide..	..	..	Two
Water	..	..	2½ ounces

Give twice normal exposure.

Brown Black to Chocolate Tones—

Developer as for Warm Black above..	..	..	½ ounce
Water	..	..	1½ ounces
'Tabloid' Ammonium Bromide..	..	..	Two

Five times normal exposure.

Formulæ for other developers are given on the labels and cartons of all suitable 'Tabloid' developing agents, and a special dark-room card, entitled "Colours on Lantern Slides by Development" (sent gratis on request to Burroughs Wellcome & Co.), gives further information to those interested in this class of work.

TONING

Prints, lantern slides, transparencies and ciné positive films can often be considerably improved, from a pictorial point of view, by toning. Providing the following important points are borne in mind, the process will be found to be quite simple, and successful results certain.

(1) The material to be toned must be correctly exposed for the particular toning process chosen and fully developed.

For blue toning rather light prints give the best results. For sepia and other toning baths, prints must be fully exposed and fully developed. Over-exposed and under-developed prints yield weak washed-out tones.

(2) Perfect fixation and thorough washing also are most essential.

Partially fixed or imperfectly washed prints, etc., are frequently the cause of patchy toning and stains.

Particular attention should be paid to double weight bromide paper.

SEPIA TONING

'Tabloid' Sepia Toner produces a rich permanent sepia tone.

Each carton contains 'Tabloid' Bleaching Compound and 'Tabloid' Sulphiding Compound.

The instructions that follow apply to ciné films, lantern slides and transparencies as well as bromide and gaslight prints, unless otherwise indicated.

FOR BROMIDE AND GASLIGHT PRINTS.—To secure the best results, it is advisable to use fresh developer

for each print or enlargement, develop fully, thoroughly fix and wash. The prints should be first immersed in a solution made by dissolving one 'Tabloid' Bleaching Compound in two to four* ounces of water and thoroughly bleached to a light colour.

It is important that the prints, etc., should be entirely free from hypo, otherwise uneven bleaching may result.

After rinsing in running water, prints should be immersed in a solution made by dissolving one 'Tabloid' Sulphiding Compound in two to four* ounces of water. The prints will gradually acquire a rich sepia colour, or, in the case of gaslight prints, a somewhat warmer tone. Do not remove them from the toning bath too quickly, but give them time to acquire full strength, then wash them in running water for about 10 minutes. Colder brown or brown-black tones can be obtained by subsequent treatment with 'Tabloid' Brown Toner (see page 50).

A preliminary soaking in the sulphiding bath before bleaching will also give a darker tone on some papers.

SPECIAL NOTE.—Good dark sepia tones can be obtained only with fairly strong and fully-developed prints from good negatives. The exposure of the paper must be such that it can be developed right out until all action stops. Prints which have been over-exposed and removed from developer before development is completed, tone to a weak, yellow-brown colour, as also do prints from weak or flat negatives. Proper fixation and washing are also essential.

There is a slight variation in tone according to the brand of paper used, though not to any marked extent. If your favourite paper gives you too yellow a brown, use 'Tabloid' Brown Toner (see page 50).

* The stronger solution works more rapidly and gives a stronger result.

FOR LANTERN SLIDES, CINÉ FILMS AND TRANSPARENCIES a stronger solution (one 'Tabloid' Bleaching Compound in two ounces of water) may be used, as bleaching is somewhat slower owing to extra thickness of emulsion, and to the fact that the support does not allow the solution to act from both sides, as in the case of prints.

The results obtained by 'Tabloid' Sepia Toner are permanent.

'Tabloid' Brown Toner.—This special formula is designed for the purpose of toning sepia prints on bromide or gaslight papers, to the colder richer brown which is preferred for certain subjects. It is also suitable for use with sepia-toned lantern slides.

This formula will not tone a black image. Sepia Toner must be used first.

The process is very simple. Take a print or slide previously toned with the sepia toner and immerse it in a solution of one 'Tabloid' Brown Toner in one ounce of 10 per cent. hypo solution.* The warm sepia changes first to a cold brown and finally to a rich brown-black. Time of immersion, 2 to 10 minutes, according to tone desired, bearing in mind that prints become colder on drying. After toning, wash in running water for 30 minutes.

In the course of toning the whites become slightly tinted to a cream tone, which is particularly suited to the colour of the image and enhances the artistic effect. If undue discoloration of the whites occurs, it is due to:—

- (1) Insufficient washing after sepia toning.
- (2) Insufficient washing after brown toning.

To remove discoloration, soak the print for a few minutes in a weak solution of nitric acid (four drops to the ounce), then wash as usual.

Variation in Tone.—As it is desirable to have the power of producing cold brown tones on bromide

* 10 per cent. hypo solution may be made by dissolving one 'Tabloid' Hypo in one ounce of water, or by diluting the usual stock 20 per cent. hypo solution with an equal volume of plain water.

and gaslight papers, research was undertaken, and the following simple method worked out:—

Bleach the print in—

'Tabloid' Bleaching Compound ..	One
'Tabloid' Mercuric Iodide and Sodium Sulphite	One
Water	Four ounces

and then proceed to darken it in the ordinary solution of 'Tabloid' Sulphiding Compound.

The greater the proportion of 'Tabloid' Mercuric Iodide and Sodium Sulphite in the bleaching bath the colder will be the final tone.

It should be noted that in the above bleaching baths the image of the print or slide changes colour, but does not disappear.

It is possible also to vary the tone of the final result by (a) Modifying the time of bleaching, or (b) Re-developing the fully-bleached image in a very dilute developer before sulphiding. By method (a) very dark browns are obtained, for the final image is produced by the blending of the original black tone with the brown produced by the toner; and by (b) a wide range of pleasing warm tones is secured according to the extent of re-development.

BLUE AND GREEN TONING

Various formulæ have been suggested from time to time for obtaining blue and green tones on bromide and gaslight prints and lantern slides, but they have been uncertain in effect, troublesome to compound, or unsatisfactory from the point of view of the colours produced.

All these difficulties are now removed by the introduction of 'Tabloid' Blue and Green Toners, which yield satisfactory baths by simple solution in water.

'Tabloid' Blue Toner provides the means of toning bromide and gaslight prints, lantern slides, ciné films and transparencies to a very pleasing blue, specially

suitable for marine and some still-life subjects and for decorative purposes. Each carton contains a tube of 'Tabloid' Blue Toner (A) and a tube of 'Tabloid' Blue Toner (B).

DIRECTION.—Dissolve one A product in one ounce of water,* and one B product in a separate ounce, and mix the two solutions. Immerse the prints or slides for from **three-quarters** to one-and-a-half minutes, according to temperature, in the green solution thus formed, keeping prints moving, and rocking the dish in the case of slides. Wash in running water until yellow stain disappears. Be careful not to wash too long, or the blue colour may disappear with certain waters. It can, however, be restored by a bath of very dilute hydrochloric acid. When dry, the colour is permanent.

As 'Tabloid' Blue Toner slightly intensifies the image it is best to start with rather light prints.

NOTE.—Short toning gives a better colour than long toning and leaves the whites purer. Tinted high lights are a sign of over-toning. A **very weak** alkaline bath may be used to clear high lights degraded by over-toning.

'Tabloid' Green Toner is very suitable for toning bromide or gaslight prints, lantern slides, cine films and transparencies of landscapes, studies of grasses, moon-light scenes, seascapes, etc. It gives a very pleasing green tone which may be varied slightly at will to suit the subject.

Each carton contains a tube of 'Tabloid' Green Toner (A) and a tube of 'Tabloid' Green Toner (B).

DIRECTION.—Dissolve one A product in two ounces of water, then add one B product and allow the solution to stand for a few minutes. Tone the prints or slides in the green solution thus obtained for from **three-quarters** to one-and-a-half minutes, according to temperature, when they will assume a blue tone, which, upon washing in running water for about 4 minutes, changes to green. Longer toning gives a rather brighter green; longer washing, 7 to 8 minutes, gives a yellower green.

* Caution should be exercised when using tank water, as it may be unsuitable.

NOTE.—Short toning gives the most pleasing colour and does not stain the high lights (*see note under Blue Toner, pages 51 and 52*). For certain subjects, a brighter blue or green tone may be desirable, which may be effected by reducing the toned print with 'Tabloid' Potassium Ferricyanide or with 'Tabloid' Bleaching Compound, followed by fixing.

COPPER TONING

'Tabloid' Brand Copper Ferrocyanide Toning Compound.—This preparation enables the photographer to avail himself of the Ferguson process of copper toning without the necessity of encumbering his shelves with three additional bottles of solution. This process is suitable for bromide, chlorobromide and gas-light paper and lantern slides.

DIRECTION.—Dissolve each 'Tabloid' product in one ounce of water. The prints or lantern slides to be toned must be well freed from hypo, and should be first soaked in water for five minutes to ensure an even action of the toning bath. When the desired colour is reached, wash in the ordinary way for ten minutes.

A black, greeny-black or rusty-looking print or cold black lantern slide can be changed in colour to a pleasing warm black by an immersion of from one-half to one minute, whilst, if the toning action is allowed to continue, a fine red chalk colour will be obtained. If it be desired to secure this red colour at its best, it is advisable to start with **very vigorous prints and slides**. Between these extremes, various shades of purple, brown and red are obtainable. The bath is not suitable for toning **glossy** bromide prints. The brilliance and permanence of toned slides are enhanced by coating with ordinary negative varnish.

NOTE.—This bath works more slowly in cold weather.

DOUBLE TONING

The employment of 'TABLOID' TONERS for producing two or more colour effects adds a new fascination to photography. The multiple toning is accomplished with the aid of a spirit varnish or masking varnish as used by aerograph workers, which is used to cover those portions of the print which are not intended to take the colour of the particular toning bath in use, one colour being produced at a time. By the method described below, it is easy to achieve first-rate results.

DIRECTION.—A good, plucky print is made from a suitable subject. Assuming the colours selected are sepia and green, apply the varnish with a camel-hair brush to those parts of the print which it is not desired to tone sepia. When the varnish dries, proceed to tone sepia in the usual way, dry the print and remove the varnish with cotton wool dipped in methylated spirit. Carry out the green toning by varnishing the parts of the print already toned sepia. Judicious selection of subject and colour will result in many pleasing effects by this method.

SUPPLEMENTARY
INFORMATION

In this section is included information as to the use of certain chemicals, which cannot be dealt with conveniently under the chapter headings of Exposure, Development, Printing, Toning, etc.

RESTRAINERS

Restrainers are used to prevent chemical fog, and to retard development. 'TABLOID' DEVELOPERS contain sufficient restrainer for normal use. For developing very rapid plates in warm weather or in hot climates, and for lantern-slide making, additional restrainer may be required.

'Tabloid' Ammonium Bromide is chiefly used in lantern-slide work, when warm tones are required.

'Tabloid' Potassium Bromide is generally employed with 'Rytol,' Hydroquinone and Metol-Quinol Developers.

'Tabloid' Sodium Citrate for use with Metol and Amidol.

DIRECTION.—If less than a grain of restrainer be required, dissolve one 'Tabloid' product in a drachm of water and add a portion of this to the developer. If one or more grains of restrainer are needed, the necessary number of 'Tabloid' products may be added direct to the developing solution.

PRESERVATIVES

'Tabloid' Developers contain sufficient preservative to ensure proper action of the solution in normal use. When the normal developer is diluted, or is to be kept in solution for some time before use, additional preservative may be required. For this purpose add one 'Tabloid' Sodium Sulphite to every one or two ounces of solution. No attempt should be made to keep a solution of amidol. It must be freshly prepared to obtain the best results.

'Tabloid' Sodium Sulphite, Dried, gr. 5, possesses great advantages over the ordinary crystals, especially in keeping quality. It may be used in exactly the same way, either for compounding the photographer's own formula, or for adding to 'Tabloid' Developers when dilution necessitates prolonged immersion in the developing solution. Five grains of the 'Tabloid' salt are equivalent to 10 grains of the ordinary crystals.

'Tabloid' Potassium Metabisulphite, gr. 10, may be conveniently used in compounding any formula in which potassium metabisulphite is indicated.

To shorten the washing of plates or prints after bleaching with 'Tabloid' Chromium Intensifier (*see pages 33 and 34*), a solution of one 'Tabloid' Potassium Metabisulphite to each ounce of water may be rapidly poured on and off the plate, or print, until the yellow stain disappears. Then wash for a minute or two.

It is also the best chemical to add to hypo solution to make an acid-fixing bath (*see page 30*).

ALKALI

The alkali generally used in making accelerating solutions is common soda, which is indefinite in strength and frequently impure.

'Tabloid' Sodium Carbonate, gr. 44, provides the photographer with a pure, reliable, portable alkali in convenient ready-weighed quantities.

One in an ounce of water forms approximately a 10 per cent. solution of sodium carbonate, a little of which may be added, if desired, to the normal developer to accelerate its action. The 'Tabloid' product may be employed also in compounding developers of special formulae, and for any other purpose for which the ordinary crystals are used.

HARDENER AND CLEARER

When a hardening and clearing bath for plates, films, lantern slides, gaslight or bromide prints is required:

'Tabloid' Alum and Citric Acid Compound will be found convenient and serviceable (one product in each ounce of water). This bath is used after developing and before fixing. No washing is necessary before immersion, but 10 minutes' washing before fixing is advisable. It is *not* suitable for use with P.O.P. prints.

HARDENER

In very hot weather or in warm climates when it is impossible to control the temperatures of the various solutions used, a plain alum bath is serviceable for hardening the film. In such circumstances the following will prove useful:—

'Tabloid' Alum, gr. 10. This product may be used for plates or prints, a useful formula being:—

'Tabloid' Alum, gr. 10	.. ..	One to two
Water	.. ..	One ounce

The exact strength depends on the amount of hardening desired. Time of immersion, about 10 minutes.

SENSITISER FOR CARBON AND OIL PIGMENT PROCESSES

Hitherto a solution of potassium bichromate, rendered alkaline by the addition of strong solution of ammonia, has been employed for the purpose of sensitising carbon tissue. The 'Tabloid' preparation of the double chromate of potassium and ammonium simplifies the operation by obviating the necessity of using ammonia solution. This preparation is equally suitable for the Oil Pigment process, and therefore is preferred to stock solutions by amateurs who make occasional carbon and oil prints.

'Tabloid' Potassium Ammonium Chromate, gr. 24

DIRECTION.—To sensitise carbon tissue for use with normal negatives.—

'Tabloid' Potassium Ammonium Chromate,	One
Water	.. .. One ounce

If printing from soft negatives, dissolve one 'Tabloid' product in two ounces of water; or, if from very hard negatives, one in six drachms of water.

Soak the carbon tissue in the sensitising solution, or float it on the surface for two or three minutes, as directed by the manufacturers of the tissue used; squeegee to remove excess of moisture, and then dry in the dark.

To sensitise oil pigment paper—use as above, and soak the paper in the sensitising solution for two or three minutes, coated side upwards, taking care no air-bells are formed. Hold up to drain, and dry in the dark.

COMPETITIVE HIGHEST AWARDS

'TABLOID' PHOTOGRAPHIC MATERIALS were awarded

- A GRAND PRIZE at the Franco-British Exhibition, London, 1908
- A GRAND PRIZE at the Japan-British Exhibition, London, 1910
- A GRAND PRIZE at the Brussels International Exhibition, 1910
- A GRAND PRIZE at the Turin International Exhibition, 1911

STAINING

To extend the range of colour on bromide and similar prints, ciné films and lantern slides beyond that produced by the usual toning methods in vogue, a series of 'SOLOID' Photographic Stains has been introduced. For firelight and forge scenes, 'Soloid' Photographic Stain (Red) gives a realistic impression; for sunlit scenes (Yellow); for landscapes and woodland scenes (Green).

For Bromide, Gaslight, P.O.P. or Platinum Prints. The prints selected for staining should possess good contrast. They should not be hardened, and, if dry, should be soaked in water until flaccid.

After removing excess of moisture, place the prints in a solution of the desired colour, which may be prepared in the following manner: Dissolve one 'Soloid' Photographic Stain of the selected colour in four ounces of water. For stronger colour effects, use less water; for weaker colour effects, use more water.

Keep the prints in the solution for a few minutes, then rinse them for 15 or 20 seconds in running water. Dry off excess of moisture by placing them between blotting paper and hang them up to dry in the usual way.

All solutions can be used over and over again until exhausted. Modifications in colour may be obtained by diluting the solutions with varying proportions of water.

For Lantern Slides, Transparencies and Ciné Films. Dissolve one 'Soloid' Photographic Stain in one ounce of water, and immerse the slides or film in the solution until the desired tint is obtained.

If a very pronounced colour is required, the strength of the solution may be still further increased.

For List, see page 72

COLOUR PHOTOGRAPHY

Natural colour photographs may be made direct from the subject by using the Lumière Autochrome plate or film, the Agfa plate, or the Finlay Colour process. The Autochrome and Agfa plates have the colour screen incorporated; the Finlay Colour process employs a panchromatic plate and a separate taking screen.

In addition, a compensating filter which must be specially made for use with the colour plate selected is necessary, and cannot be employed with success with plates of another make.

The colour plate is exposed in the camera as directed by the makers of the particular plate in use. The exposure can be calculated by means of the 'Wellcome' Exposure Calculator. The plate factor given in Table B (page 204) makes due allowance for the increased exposure necessitated by the compensating filter.

The manner in which the coloured transparency is produced differs according to which process is employed. The combined method is adopted with the Agfa and the Autochrome plates, *i.e.*, the positive is produced by the reversal of the negative. In the Finlay colour process the positive is printed from the monochrome negative; when bound up in correct register with a viewing screen the positive is seen in the colours of the original. As many coloured positives as one wishes may be obtained from the original negative in the Finlay process provided a separate viewing screen is used with each. By using 'Tabloid' Photographic Chemicals the difficulty and expense of preparing special solutions for colour photography is avoided.

COMBINED METHOD

DEVELOPMENT

This is carried out (1) in total darkness, (2) by means of a special safe light, or (3) by the light of a ruby lamp after employing 'Tabloid' Desensitiser. A normal solution of 'Rytol' Developer should be employed.

'Tabloid' 'Rytol'	.. ..	One
'Tabloid' 'Rytol' Accelerator	.. ..	One
Water	.. ..	Four ounces

Times for development are as follow: for Autochrome plates, at 55° F., 7 min.; at 60° F., 6 min.; at 65° F., 5 min. For Agfa plates, at 55° F., 5 min.; at 60° F., 4 min.; at 65° F., 3 min.

In cases of doubtful exposure factorial development may be employed.

The time and temperature method of development should be employed for colour plates, either a dish or tank being used. If it is found necessary to use a light when developing then the special safe light recommended by the makers of the plates must be used. Even to this the colour plates should not be exposed longer than can be helped, the dish being kept covered as much as possible. For development without a safe light, immerse the exposed colour plate for one minute before development in the dark in a solution of 'Tabloid' Desensitiser (one in one ounce of water). The colour plate will then be sufficiently desensitized to allow development to be carried out by any ordinary dark-room light.

REVERSAL

'Tabloid' Reversing Compound is the result of special researches undertaken by Burroughs Wellcome & Co., and possesses advantages over the usual formulæ. It works well with all the colour plates mentioned, and is easily and quickly made up by dissolving one product in one ounce of water.

After development, immerse the rinsed plate in this solution, and after one minute turn on the white light. Rock the dish and allow plate to remain in this solution until the blackened silver has been completely eaten out and the colours become transparent.

RE-DEVELOPMENT

Rinse the plate after reversal, and, in full daylight, or strong artificial light, immerse it in the same solution used for first development. Continue re-development until the positive image appears and attains the brilliance of the original colours. Then wash for a few minutes, and dry as usual. No fixing bath is required. If the result be lacking in brightness, the cause is an error in exposure. This may be remedied by either intensification or reduction according to whether the fault is one of over- or under-exposure.

INTENSIFICATION

'Tabloid' Colour Plate Intensifier is a silver intensifier prepared for increasing the brilliance of the colours. Such an intensifier is difficult to prepare, and solutions do not keep. These objections are removed by 'Tabloid' products. Make up two solutions:—

- | | | | |
|------------------------------|----|----|-----------|
| (1) 'Tabloid' Acid Pyro | .. | .. | One |
| Distilled Water | .. | .. | One ounce |
| (2) 'Tabloid' Silver Nitrate | .. | .. | One |
| Distilled Water | .. | .. | One ounce |

Immerse the plate in No. 1 for a few seconds, then pour this liquid into solution No. 2. Pour the mixed solutions on, and rock gently until sufficient brilliance of colour is obtained.* Work in daylight and judge by looking through the plate from time to time. Finish by rinsing the plate, immersing it in weak acid-hypo solution for two minutes and washing in the usual way. Discard Intensifier as soon as solution becomes turbid.

NOTE.—This Intensifier may be used also for ordinary negatives, proceeding as described above.

REDUCTION

If the transparency is much too dark, due either to under-exposure or under-development, an improvement may be brought about by careful reduction with a weak solution of 'Tabloid' Potassium Ferricyanide in ten per cent. hypo solution.

DUPLICATING METHOD

For the Finlay Colour Process, where a colour screen on a separate glass is used, the developer for the panchromatic plate should be:—

- | | | | |
|-------------------------------|----|----|-------------|
| 'Tabloid' 'Rytol' | .. | .. | One |
| 'Tabloid' 'Rytol' Accelerator | .. | .. | One |
| Water | .. | .. | Four ounces |

Time the development according to the temperature, and, if it be 55° F., 60° F., or 65° F., develop for 12 minutes, 10 minutes, or 9 minutes respectively, then fix in acid-hypo solution (20 per cent.) and dry in the usual way. From this negative, a glass positive transparency is made by contact, and developed with 'Tabloid' 'Rytol' (normal strength) or 'Tabloid' Hydroquinone. The positive, bound up with the special viewing screen, constitutes the finished picture.

* Sometimes during intensification the whites may become stained. In such a case, after intensification, and before fixing, immerse the plate for about half-a-minute in a solution of one grain of potassium permanganate in three ounces of water (conveniently made by using 'Soloid' Potassium Permanganate, gr. 1), then rinse and fix in the ordinary way.

COLOUR RENDERING IN MONOCHROME

As is well known, the ordinary plate or film gives an incorrect rendering of most colours. The yellows, reds and yellow greens appear much too dark in tone, whilst the blues and violets are much too light. This colour-blind effect is partially corrected in the so-called orthochromatic plates and films. These, in conjunction with a suitable filter, give a truer rendering of the yellows and blues, but they are insensitive to red. So called "self-filter" orthochromatic plates contain a dye in the emulsion; the screening effect of this dye on exposure is provided for by the speed factors given in Table B (pages 204-210). If the minimum exposure is given the correction is not very much evident, but with full exposure the correction obtained is adequate for most landscape work.

In order to obtain a perfect rendering of a scene or object so that each colour is registered in its correct relative value in monochrome, it is necessary to employ a panchromatic emulsion in conjunction with a suitable light filter. These filters are so adjusted that the maximum effect is obtained with the minimum exposure. A panchromatic plate without a filter will give a correction approximately equal to that obtained with an orthochromatic plate and a 5x filter. In order to obtain the best results, however, a filter should always be used.

For the development of panchromatic plates and films, see pages 12-25.

The following table will be of assistance in choosing the correct filter for the best colour rendering of the particular subject, panchromatic plates or films being employed throughout:—

COLOUR RENDERING IN MONOCHROME (CONTINUED)

SUBJECT	SUITABLE FILTER	RESULT
Clouds and Distant landscape	K 2, Beta, Agfa 2, T.I.C. 3 or similar filter	Correct colour-values obtained
Snow Scenes and Blue Sky	K 1, Alpha, Agfa 1, T.I.C. 2 or similar filter	Tone values prevent flat appearance
Cloud Formations and Blue Sky	Over correct with Wratten A, Agfa 4, Delta or similar filter	Increased contrast. Clouds white against dark sky
Yachts and Sea Scenes	K 2, Beta, Agfa 2, T.I.C. 3	As No. 1
Portraiture	Filter depends upon illuminant employed. With incandescent gas-light, use K 1, Alpha, Agfa 1, or similar filter	Truer tone values obtained. Retouching minimised
Copying Pictures and coloured objects	Gamma, T.I.C. 6, Agfa 3	Brings out detail and gradations
Copying old prints (Brown or Red)	Suitable red filter as issued by makers of the plate employed	Brings out detail and gradations

(See next page)

MULTIPLYING FACTORS FOR LIGHT FILTERS IN DAYLIGHT

FILTER	Panchromatic Plates and Films	Orthochromatic Plates and Films
AGFA		
No. 0	1—2	1—2
No. 1	1½—2	1½—2
No. 2	2—3	2—3
No. 3	3—4	3—4
No. 4	4—5	4—5
No. 5	5—6	5—6
ILFORD		
Alpha	1½—2	2½—3
Beta	3	—
Gamma	6	—
Iso	—	4—5
Delta	4	—
IMPERIAL		
Impan	2½	—
x 2	1½	2
x 4	2	4
x 8	5	8
ILLINGWORTH		
Ortho No. 4 ..	—	4—5
T.I.C. 2	2	1½—2
T.I.C. 3	3	—
T.I.C. 6	6	—
WELLINGTON		
No. 1	No increase	3
No. 2	2	6
No. 3	3	—
WRATTEN		
K 1	1½	3
K 2	3	8—10
G	5	24
A	10	—
F	20	—
C 5	4	3
X 1	5	—
X 2	6	—

Where no figure is given, the filter is not recommended by the maker.

POINTS ABOUT THE DIAPHRAGM OR STOP

Stops serve two main functions:—

- (1) They control the amount of light passing through the lens, and thus modify the exposure necessary.
- (2) They can be used to widen or narrow the pencils of light and so make it possible to improve the definition of far and near objects or to throw certain sections of the picture out of focus.

Stops are generally marked on the "f system." To find the *f* number, divide the focal length of the lens by the diameter of the stop. For example, a stop of 1 inch used with a lens of 8 inch focus is known as *f* 8, while a stop of 1/2 inch diameter is known as *f* 16. All lenses, irrespective of focal length, are practically identical in rapidity if used with a stop of the same *f* number.

The speed of a lens varies inversely as the square of the *f* value or the stop.

$8 \times 8 = 64$; $16 \times 16 = 256$; $256 \div 64 = 4$; therefore, with *f* 16 the exposure is four times that necessary with *f* 8.

The rapidity of lenses for a given *f* number is the same, irrespective of focal length. The depth of focus, however, varies according to the size of the stop and the focal length of the lens. The smaller the stop, the greater the depth of focus; the shorter the focal length, the greater the depth of focus.

To obtain good definition in far or near objects at the same time, a small stop must be used. To throw the background or other portions of the picture out of focus, a large stop must be used.

The question as to what stop should be used is governed by the conditions at the time of making the exposure and the purpose for which the photograph is required. Using a large stop, accurate focussing is specially necessary, a relatively short exposure may be given and atmosphere and relief will be preserved. Using a small stop, a relatively long exposure is necessary; there is, however, less need for accurate focussing. A small stop has a tendency to destroy the effect of distance and atmosphere in pictorial work, but is generally essential when sharpness in widely separated planes is necessary, and particularly in close-up technical work.

WEIGHTS AND MEASURES

It has been commonly stated that in making up photographic formulæ, the troy or apothecaries' ounce of 480 grains is used, whilst the chemicals themselves are sold by the Imperial or avoirdupois ounce of 437-1/2 grains. Such a statement is, however, erroneous, because the official ounce, for selling or compounding, contains 437-1/2 grains. In prescriptions, the symbols \bar{z} , \bar{s} and $\bar{\text{O}}$ are still commonly employed to indicate the troy or apothecaries' ounce of 480 grains, the drachm of 60 grains and the scruple of 20 grains. For photographic purposes, however, these symbols should be avoided, as they are likely to lead to confusion. The photographers' table of weights, therefore, should read

437-1/2 grains = 1 ounce
7000 grains = 16 ounces = 1 pound

All chance of error is obviated when the weight is given in grains, because the troy, apothecaries' and avoirdupois grains are equal; moreover, the U.S.A. grain is the same as the British.

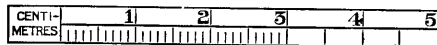
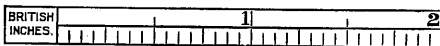
With 'Tabloid' Brand Chemicals, the employment of weights or scales of any kind is quite unnecessary.

VOLUME

U.S.A. Apothecaries' Fluid Measure—

60 minims	= 1 fluidrachm
8 fluidrachms	= 1 fluidounce
16 fluidounces	= 1 pint
8 pints	= 1 gallon

NOTE.—If working from a British formula, it is necessary to remember that the British Imperial pint contains 20 fluidounces. The U.S.A. fluidounce is, however, slightly larger than the Imperial ounce, so that a British Imperial pint contains approximately 19 U.S.A. fluidounces.



INCH AND CENTIMETRE MEASURES
(The horizontal lines on pages 85-124 are 1/3 inch apart)

THE METRIC SYSTEM

In view of the constantly-increasing use of the Metric System of Weights and Measures by photographers, the following tables are given. The equivalents in U.S.A. Standards are also shown.

It should be borne in mind that in Europe, except Britain, for dispensing purposes, liquids are always weighed, not measured.

WEIGHT

1 kilogram (kgm.)	= 1000 grammes	= 2.2046 pounds
1 gramme (gm.)	= 10 decigramms	= 15.432 grains
1 decigram (dgm.)	= 10 centigramms	= 1.5432 "
1 centigram (cgm.)	= 10 milligramms (mgm.)	= 0.154 grain

CAPACITY

1 litre (L.)	= 10 decilitres	= 33.814 U.S.A. fl. oz.
1 decilitre (dl.)	= 10 centilitres	= 3.382 " "
1 centilitre (cl.)	= 10 millilitres	= 0.338 " "
*1 c.c. (cubic centimetre)	= 0.999 millilitre	= 16.23 minims

LENGTH

1 metre	= 10 decimetres	= 39.3701 inches
1 decimetre	= 10 centimetres	= 3.937 " "
1 centimetre	= 10 millimetres	= 0.3937 inch

For a comparison of the values of some of the more frequently employed expressions of the Metric and the U.S.A. Systems, the following may be found convenient for reference:—

1 mgm. (milligram)	= 0.0154 grain (or approx. 1/64 grain).
1 gm. (gramme)	= 15.432 grains.
1 kgm. ("kilo" or kilogram)	= 2 lb. 3-1/4 ounces avoirdupois.
1 ounce avoirdupois	= 437.532 grammes.
1 ounce avoirdupois	= 28.35 grammes.
1 grain	= 0.0648 gramme or 64.8 milligramms.
1 mm. (millimetre)	= 1/25 of an inch.
1 cm. (centimetre)	= 2/5 of an inch.
1 inch	= 25.4 millimetres or 2-1/2 centimetres.
1 L. (litre)	= 33.8 fluidounces, U.S.A. measure (approx.).
1 fluidounce, U.S.A. measure	= 29.57 cubic centimetres.
1 pint, U.S.A. measure	= 473.18 cubic centimetres.
1 gallon, U.S.A. measure	= 3.785 litres or 8.345 lb. avoirdupois of pure water at 4° C. and under an atmospheric pressure of 30 inches of mercury.

* For ordinary photographic purposes it is convenient and sufficiently exact to consider that 1 c.c. = 16 minims, that 30 c.c. = 1 fluidounce, and that 1000 c.c. = 33.8 fluidounces.

SELLING PHOTOGRAPHS FOR REPRODUCTION

There are three ways of submitting photographs for the consideration of editors:—

(1) **Personally.** This is the best method for the town photographer who has time at his disposal, and particularly is it so when the subjects to be submitted are of value chiefly for their "news" interest. Such photographs an editor will always be glad to see and to accept or reject at once, thus leaving the photographer the opportunity of submitting them elsewhere, in case of refusal, before they have lost their freshness.

(2) **By Post.** This is a good method for the out-of-town worker, and perhaps the best method in dealing with weekly and monthly publications. In submitting by post, always state whether the photographs are offered exclusively and whether a special fee is required. Enclose stamped addressed envelope if return of photographs is desired.

(3) **By Agency.** In all the large cities there are Agencies (*see* DIRECTORY) which are prepared to submit prints to editors on a commission basis, usually 25% to 40%, according to the standing of the Agency or the amount of work done. Such Agencies naturally know the best papers for particular subjects; they will develop plates, copy single prints and circulate copies promptly, and collect the fees.

Essentials of Press Photographs.—The negatives must be sharp and capable of yielding bright prints or enlargements. Prints on glossy bromide paper are preferred, and should be 1/1 plate size.



TRADE MARK 'TABLOID' BRAND

PHOTOGRAPHIC PRODUCTS

Always say or write the word 'Tabloid'

'Tabloid' Brand Developers

- 'TABLOID' 'RYTOL' UNIVERSAL DEVELOPER (25 of each)
- 'TABLOID' 'RYTOL' UNIVERSAL DEVELOPER (100 of each)
- 'TABLOID' 'TANCOL' DEVELOPER
- 'TABLOID' AMIDOL DEVELOPER
- 'TABLOID' HYDROQUINONE (QUINOL) DEVELOPER
- 'TABLOID' METOL DEVELOPER
- 'TABLOID' METOL-QUINOL DEVELOPER
- 'TABLOID' PYRO-METOL DEVELOPER (*Imperial Standard Formula*)
- 'TABLOID' PYRO-SODA DEVELOPER (*Ilford Formula*)

'Tabloid' Brand Desensitiser

For Development without a dark-room, see page 31

'TABLOID' DESENSITISER

'Tabloid' Brand Toners

For Bromide and Gaslight Prints or Lantern Slides

- 'TABLOID' BLUE TONER
- 'TABLOID' GREEN TONER
- 'TABLOID' SEPIA TONER
- 'TABLOID' BROWN TONER
- 'TABLOID' COPPER FERROCYANIDE TONING COMPOUND
- 'TABLOID' SULPHIDING COMPOUND

For P.O.P. Prints

- 'TABLOID' PLATINUM TONING COMPOUND
- 'TABLOID' GOLD CHLORIDE WITH SULPHO-CYANIDE COMPOUND (B 6)
- " " WITH THIOSULPHATE COMPOUND (COMBINED BATH) (B 10)

'Tabloid' Brand Restrainers

- 'TABLOID' AMMONIUM BROMIDE, gr. 1
- 'TABLOID' POTASSIUM BROMIDE, gr. 1
- 'TABLOID' SODIUM CITRATE, gr. 1

'Tabloid' Brand Alkali

- 'TABLOID' SODIUM CARBONATE, gr. 44

'Tabloid' Brand Preservatives

- 'TABLOID' POTASSIUM METABISULPHITE, gr. 10
- 'TABLOID' SODIUM SULPHITE, DRIED, gr. 5

'Tabloid' Brand Hardener

- 'TABLOID' ALUM, gr. 10

'Tabloid' Brand Hardener & Clearer

- 'TABLOID' ALUM AND CITRIC ACID COMPOUND

'Tabloid' Brand Density Reducers

- 'TABLOID' AMMONIUM PERSULPHATE, gr. 11
- 'TABLOID' POTASSIUM FERRICYANIDE, gr. 2
- 'TABLOID' BLEACHING COMPOUND

'Tabloid' Brand Intensifiers

- 'TABLOID' CHROMIUM INTENSIFIER
- 'TABLOID' MERCURIC IODIDE AND SODIUM SULPHITE

'Tabloid' Brand Sensitiser

- 'TABLOID' POTASSIUM AMMONIUM CHROMATE, gr. 24

'Tabloid' Brand Fixer

- 'TABLOID' SODIUM THIOSULPHATE, DRIED, gr. 28.5

'Tabloid' Brand Products for Direct Colour Photography

- 'TABLOID' REVERSING COMPOUND
- 'TABLOID' COLOUR PLATE INTENSIFIER

TRADE MARK 'SOLOID' BRAND PHOTOGRAPHIC STAINS

- 'SOLOID' PHOTO STAIN (Green)
- 'SOLOID' PHOTO STAIN (Red)
- 'SOLOID' PHOTO STAIN (Yellow)

} For Colouring
Bromide prints,
Lantern slides,
etc.

'TABLOID' and 'SOLOID' Photographic Products are sold by Druggists and Photographic Dealers everywhere

Beware of Imitations

PERMITS TO PHOTOGRAPH

APPLY for permits well in advance of the dates for which they are required. *Always enclose a stamped addressed envelope for reply.*

Special care must be taken to avoid the use of the camera in the vicinity of fortifications, military or naval works.

Great Britain—

IN GENERAL—

Permits for Abbey and Castle Ruins are obtainable from the Stewards, for Cathedrals from the Deans, for Churches from the Vicars, for Colleges from the Masters or Deans, for Private Parks, Mansions and Estates from the Estate Agents, the Stewards, or from the owners.

LONDON AND ITS ENVIRONS—

Parks and Open Spaces controlled by the L.C.C.—permits not required for hand cameras; for stand cameras, apply to Chief Officer, Parks Department, County Hall, Westminster Bridge, S.E. 1. Bethnal Green Museum—Director and Secretary, Victoria and Albert Museum, S.W. 7. Special regulations for stand work.

British Museum, Bloomsbury, W.C. 1—For regulations, apply to Director in writing, allowing time for reference to Department concerned.

The object proposed to be photographed must be specified by the Museum number.

Hand cameras may be used to photograph exhibited objects without special sanction.

Burnham Beeches; Coulsdon Common; Farthing-down; Highgate Wood; Queen's Park, Kilburn; Riddlesdown; West Wickham Common—free permit for hand cameras from the Town Clerk, Guildhall, E.C. 2, or produce copy of the Royal Photographic Society's "The Red Book."

Bushey Park; Green Park; Greenwich Park; Hyde Park; Hampton Court Park, Gardens and Green; Kensington Gardens; Natural History Museum Gardens; Primrose Hill; Regent's Park; Richmond Park; St. James's Park; Tower of London Gardens; Victoria Tower Gardens—no restrictions to use of hand camera in unenclosed portions; but the taking of portraits and groups is forbidden. For stand camera, Secretary, H.M. Office of Works, Storey's Gate, S.W. 1.

Epping Forest and Wanstead Park—Town Clerk, Guildhall, E.C. 2.
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Guildhall and the Crypt—Town Clerk, Guildhall, E.C. 2.

Guildhall Art Gallery—Mr. J. L. Douthwaite, Director of the Gallery, Guildhall, E.C. 2.
Guildhall Library and Museum, and their contents—Mr. J. L. Douthwaite, Librarian, Guildhall, E.C. 2.

- LONDON AND ITS ENVIRONS—continued**
- Halls of City Companies—Clerks to the various Companies.
- Houses of Parliament—Secretary, Lord Great Chamberlain's Office, House of Lords, with letter of recommendation from member of either house.
- Imperial Institute—Secretary, S.W. 7.
- Kew, Royal Botanic Gardens. *3d.*, in addition to admission fee, made for photographing or sketching.
- Lincoln's Inn—Under-Treasurer, Treasury Office, Lincoln's Inn, W.C. 2.
- National Gallery—Keeper, Trafalgar Square, W.C. 2. Permits to professional photographers only, on Thursdays and Fridays.
- Natural History Museum—Director, British Museum (Natural History), Cromwell Road, S.W. 7. Hand cameras without permit. Special regulations govern stand work and publication of photographs of the Galleries, etc., and of specimens therein. Photographs taken on payment for the public by the museum photographer so far as his other duties permit.
- Public Record Office—Literary Search Room, Chancery Lane, W.C. 2.
- St. Bartholomew the Great, W. Smithfield—Verger. Fee *2s. 6d.* per day (9-30 a.m. to 5 p.m.). No photography during Services.
- St. Paul's Cathedral—Dean's Verger in the Cathedral. Fee, *2s. 6d.* per day. Special restrictions. No photography during Services.
- St. Paul's Garden (up to 12 noon)—Town Clerk, Guildhall, E.C. 2.
- Tate Gallery—Director, Tate Gallery, Millbank, S.W. 1. Permits are given to accredited professional photographers under special conditions.
- Tower of London—Resident Governor of the Tower. References required. Hand cameras, within precincts of Tower, without previous reference. Cinema photography forbidden.
- Victoria and Albert Museum—Director and Secretary, South Kensington, S.W. 7. Special regulations for stand work.
- Westminster Abbey—Chapter Clerk, The Sanctuary, Westminster, S.W. 1. Permission granted under exceptional circumstances only. Fee, each photo, *5s.* to the Fabric Fund.
- Zoological Gardens—hand Ciné cameras using substandard film and hand cameras without permit. Stand cameras, permit (a fee, *10s.* for year, or *2s. 6d.* for one occasion) from Secretary.

PROVINCES—

- Bath Abbey—Rector and Archdeacon. Fee, *1s.*
- Bayham Old Abbey—Admission *6d.*, Wednesdays and Saturdays, summer months.
- Bristol Cathedral—Sub-Sacrist. Fee, one day, *1s.*; over one day, *2s. 6d.* General permit applies to ground floor only. Special permit necessary for roofs, towers and windows.
- Bristol Zoological Gardens—admission fee only.
- Canterbury Cathedral—Mr. J. McClemens, Senior Vesturer. Fees vary. Nave and Precincts free.
- Chester Cathedral—Dean or Sacrist. No fee. The whole Cathedral, with its monastic buildings, is open and free from 7.30 a.m. to dark.
- Chetham's Hospital and Library, Hunt's Bank, "The College" (1420), Manchester—from the House Governor.
- Chichester Cathedral—Vergers, *2s. 6d.*
- Deerhurst Saxon Church—Parish Clerk, fee *2s.*, in addition to charge for admission, *6d.*
- Durham Cathedral—Head Verger, *2s. 6d.* for week; members of Royal Photographic Society, *1s.* Triforium, with the Dean's permission, fee *5s.*
- Ely Cathedral—Dean. A stamped and addressed envelope must be enclosed. No special fee, but it is hoped visitors will contribute to Fabric Fund. Apply to the Head Verger.
- Exeter Cathedral—Dean or Chapter Clerk. Small charge; particulars from the Verger.
- Fountains Abbey—no special fee. Admission, *1s.*
- Gloucester Cathedral—Sub-Sacrist's Office. Fee (photo) for day, *5s.* Sketching, *5s.* for week.
- Hastings Castle—admission *3d.* Norman Dungeons, *6d.* Weekly tickets, *1s.* Castle closed Sundays.
- Hereford Cathedral—Verger. Amateurs, free; Professionals, local, *5s.*; others, *£1 1s.*
- Knebworth House—Agent, Estate Office, Knebworth. Admission, *1s.*, except Fridays, *2s. 6d.*; children half price. Special terms for educational parties, fee for photographs, *2d.* Sundays by special arrangement only.
- Lichfield Cathedral—Canon in Residence, The Close, Lichfield—special conditions, no fee.
- Lincoln Cathedral—Dean or Canon in Residence. Fee, *2s. 6d.* to Visitors' Fund.
- Liverpool Cathedral—Dean, the Very Rev. F. W. Dwelly, at the Cathedral.
- Ludlow Castle—on payment of admission fee, *1s.* Special terms for parties of 80 or more.

PROVINCES—*continued*

- Newcastle Cathedral Church—Provost, Newcastle Cathedral Vestry, Newcastle-on-Tyne.
- Norwich Cathedral—Sub-Sacrist, at Cathedral. One day 2s. 6d., and 1s. for every succeeding day.
- Norwich Strangers' Hall (14th to 18th Century). Amateurs, admission 6d. Professionals should apply to the Curator, Castle Museum, Norwich.
- Norwich Castle Museum and Art Gallery—Amateurs, admission free, except Tuesdays and Fridays, 3d. Professionals; Curator.
- Norwich Bridewell Museum of Local Industries—Amateurs, admission free. Professionals; Curator, Castle Museum.
- Peterborough Cathedral—Verger on duty. No fee. Raglan Castle—Admission 6d. Charge to amateurs for photographing, 1s.; professionals, 10s.
- Romsey Abbey—Sacristan. Amateurs, fee of 2s.; for trade or professional purposes, £1 1s.
- St. Albans Cathedral—Dean. No special fee.
- St. Asaph Cathedral—by arrangement with Verger.
- St. Mary Redcliffe, Bristol—Vicar. Fee, 2s.
- Selby Abbey—free. Strict regulations against use of artificial light. Vicar reserves right of reproduction. Apply, Vicarage.
- Stokesay Castle—Amateurs, free; professionals, £1 1s.
- Tewkesbury Abbey—Sacristan. Fee, 1s., in addition to admission fee to choir and chapels, 6d.
- Trinity College, Cambridge—Sign book at Porter's Lodge. Interiors—Junior Bursar.
- Truro Cathedral—Canon in Course; apply to Verger. Fee, 2s. 6d. for one day. Rights of publication reserved.
- Warwick Castle—fee for grounds and court-yard, 6d. in addition to admission fee. Porter's Lodge or Grounds Keeper.
- Wells; Bishop's Palace, Bishop. Special restrictions. For trade purposes, permits granted to local photographers only.
- Wells Cathedral—Canon in Residence. Fee, 1s. per day. Entrance to Choir, 6d.
- Winchester Cathedral—Dean. Fee, 1s. for the day; 2s. 6d. for one week.
- Windsor Castle, exterior only—Deputy-Governor.
- Windsor Great Park and Virginia Water—Deputy Ranger, Ranger's Lodge, Windsor Park.
- Worcester Cathedral—Custos—Snapshots, free; Exposures, 2s. 6d. per day, including admission to Tower, Crypt and Chapter House.

PROVINCES—*continued*

York Minster—Fee, 2s. 6d. per day. Permits—booktable or Chapter Clerk's Office, 1, Minster Gates, York.

SCOTLAND—

Edinburgh Zoological Park—Gate-keeper.

Holyrood Park; Linlithgow Park (Peel); Royal Botanic Gardens and Arboretum, Edinburgh. No restrictions on use of hand cameras in unenclosed portions. Portraits and groups forbidden. For stand camera, H.M. Office of Works, 122, George Street, Edinburgh. Red Book of the Royal Photographic Society accepted as permit.

N.B.—Permission of Regius Keeper necessary for stand camera in Royal Botanic Gardens and Arboretum, Edinburgh.

HISTORIC BUILDINGS OF INTEREST IN CHARGE OF H.M. OFFICE OF WORKS—For stand cameras, apply Respective Caretakers. Buildings occupied by troops, permission of Military Authorities is necessary.

England and Wales

Admission free:—Acton Burnell Castle; Blackbury Castle; Bowes Castle; Burgh Castle; Cymmer Abbey; Dunstanburgh Castle; Newport (Mon.) Castle; Penrith Castle; St. James's Chapel, Lindsey; Strata Florida Abbey; Tretower Court; Waltham Abbey Gatehouse.

Admission 3d.:—Basingwerk Abbey; Berkhamstead Castle; Brough Castle; Coity Castle; Dolwyddelan Castle; Ewloe Castle; Flint Castle; Langley Chapel; Ogmere Castle; Reculver Towers; Reytormet Castle; St. Catherine's Chapel; St. Olave's Priory; Stoney Littleton, Long Barrar; Tynemouth Priory; Tintagel Castle; Uley Tumulus.

Admission 6d.:—Beaumaris Castle (ratepayers free); Brougham Castle; Buildwas Abbey; Byland Abbey; Caerleon Amphitheatre; Carisbrooke Castle (closed Sunday); Carlisle Castle; Carnarvon Castle; Castle Acre Priory; Clifford's Tower, York (closed Sunday); Dartmouth Castle; Denbigh Castle; Dover Castle Keep; Egglestone Abbey; Farleigh Castle; Finchale Priory; Framlingham Castle; Furness Abbey; Goodrich Castle; Greenwich Royal N. C. (closed Fridays, Painted Hall only, open on Sundays, admission free); Grosmont Castle (closed Sunday, October-March); Harlech Castle; Haughmont Abbey; Helmsley Castle; Kensington Palace

HISTORIC BUILDINGS—continued

State Apartments (Saturday and Sunday afternoons, April 1 to Nov. 30); Kidwelly Castle; Kirby Hall; Kirby Musloe Castle (closed Sunday); Kirkham Abbey; Lamphay Palace, Lindisfarne Priory; Llawhaden Castle; Middleham Castle; Muchelney Abbey; Netley Abbey; Norham Castle; Old Sarum; Pendennis Castle; Pevensey Castle; Pickering Castle; Porchester Castle; Richborough Castle; Richmond Castle (Great Court, open Sunday only); Roche Abbey; St. Botolph's Priory; Titchfield Abbey; St. Mawes Castle; Stonehenge; Tintern Abbey; Warkworth Castle; Warkworth Hermitage; Walmer Castle (open Thursday afternoon only); Whitby Abbey; White Castle.

Admission 7d.—Easby Abbey.

Admission 1s.—Hampton Court Palace, State Apartments (free Sunday), Saturday 6d.; Rievaulx Abbey (closed Sunday).

Scotland

Admission Free.—Balvenie Castle; Beaulieu Priory; Berwick Castle; Blackfriars Chapel, St. Andrews; Burleigh Castle; Cardoness Castle; Carlisle Castle; Claypotts Castle; Cross Kirk, Peebles; Duffus Castle; Duffus Kirk and Kirkyard; Dunblane Cathedral; Dunfermline Abbey; Dunglass Chapel; Earls and Bishops Palace, Kirkwall; Edens Hall; Edinburgh Castle (Precincts and Scottish War Memorial); Eynhallow Church; Fortrose Cathedral; Glasgow Cathedral; Kelso Abbey; Kinkell Church; Kodel Church; McClellan's Castle; Noltland Castle; Orchardton Towers; Pierowall Church; St. Machar Cathedral; St. Martin's Church, Haddington; St. Ninian Chapel, Isle of Whithorn; St. Andrews Cathedral; Scalloway Castle; St. Magnus Church, Egilway; Skelmorlie Aisle, Viera Chapel Ruins.

Admission 1d.—Abernethy Round Tower.

Admission 3d.—Arbroath Abbey; Blackness Castle; Culross Abbey; Cymer Abbey; Kirkcubright; Lincluden College; Skara Ancient Dwellings; Sweetheart Abbey; Torphichen Kirk; Urquhart Castle; Whithorn Priory.

Admission 6d.—Affleck Castle, Monikie; Brechin Round Tower; Crichton Castle; Crossraguel Abbey; Dirleton Castle; Dryburgh Abbey; Dundrennan Abbey; Dunkeld Cathedral; Edinburgh Castle, Historical Apartments (free Saturday

HISTORIC BUILDINGS—continued

and King David's Tower (both closed Sundays); Elcho Castle; Elgin Cathedral; Hailes Castle; Hermitage Castle; Huntingtower, Perth; Huntly Castle; Inchcolm Abbey; Inchmahome Priory (boat 6d. extra); Jedburgh Abbey; Linlithgow Palace; Maeshowe Chambered Mound; Melrose Abbey; Palace of Holyroodhouse, Historical Apartments (free Saturday and Sunday) and State Apartments (closed Sunday); Restenneth Priory; St. Andrews Castle; Stirling Castle (local rate-payers free, except to Vaults); Tantallon Castle; Threave Castle; Tolquhan Castle.

Admission 1s.—Palace of Holyroodhouse, Historical Apartments (Tuesday).

U. S. A.—

With certain exceptions, hand cameras are permitted in all Federal Government Reservations, City and State parks. Exceptions include museums of natural history and art, aquariums and any place or building where the authorities make and sell pictures of the various objects, and use revenue for the upkeep of the institution, etc.

In most instances, however, bona fide visitors from other cities and countries may obtain special permission, free of charge, to use a hand camera, from the Superintendent or Officer in charge.

In the Public Parks of all cities of importance the use of stand cameras without a permit is forbidden. A permit may be obtained from the Commissioner of Parks, or other local authority. There is no charge for such permits, but satisfactory evidence must be shown that the pictures are not to be used for commercial purposes.

In New York City and all cities of importance, use of stand camera without permit forbidden. Apply local Police Department. Small fee usually charged.

France—

Photographs may be taken in the streets, public parks and squares of Paris, so long as the directions of the keepers, police, etc., are regarded, and no inconvenience to traffic is caused.

Cathedrals and other Historical Monuments attached to the Administration of fine Arts—apply to M. le Directeur des Beaux Arts (Services des Monuments Historiques), 3, Rue de Valois, Paris. National Museums—apply to Monsieur le Directeur des Musées Nationaux, Palais du Louvre, Paris. Authorisations subject to a tax of Frs. 5 per day

FRANCE—continued

or Frs. 2 per object; or to a subscription duty as follows—For one museum, Frs. 20 per month, Frs. 40 for 3 months, Frs. 60 for 6 months, Frs. 100 for 12 months. For all National museums, Frs. 40 per month, Frs. 80 for 3 months, Frs. 120 for 6 months, Frs. 200 for 12 months. For full details, apply Musée du Louvre, salle du Manège.

A photograph of identity (3 cm. × 4 cm.) must be enclosed with the application.

Jardin d'Acclimatation—Monsieur le Directeur du Jardin d'Acclimatation, Bois de Boulogne, Paris (16^e).

Jardin des Plantes—for particulars of authorised fees, apply to M. le Directeur du Muséum National d'Histoire naturelle, Paris.

Greece, Denmark, Holland, Belgium, Norway, Sweden, Spain and Portugal—

No restrictions for streets and public places, provided directions of police, keepers, etc., are regarded, and no inconvenience to traffic is caused. For Cathedrals, Museums, Public Buildings, Gardens, etc., apply to respective authorities. Military or naval works and fortifications, railway centres, junctions, bridges, etc., and railways under construction should be avoided.

GREECE—For Museums, etc., apply to Monsieur le Directeur de la Section archéologique du Ministère des Cultes et de l'Instruction publique.

Italy—

Permits to photograph articles belonging to the State, or kept in Government Art Institutes can be obtained by making application, on L. 1 stamped paper, to the "Direzione" or "Soprintendente" of such Museums and Institutes. In respect to private collections to which the public is admitted, a request on unstamped paper addressed to the "Soprintendente" is sufficient. No restrictions for street work, except in fortified areas.

Japan—

Persons landing at any port in the Japanese Empire, including South Manchuria, should be careful to ascertain whether the port is in a fortified area. In case of doubt, no camera should be carried ashore until enquiry has been made.

Other Countries—

Similar regulations to those indicated are in force in most countries. Should any difficulty arise, apply to the British Consul or Diplomatic Representative. In many countries a passport is a convenience if not a necessity.



THE
TRADE MARK

'**TABLOID**'

The word 'TABLOID' is a registered Trade Mark.

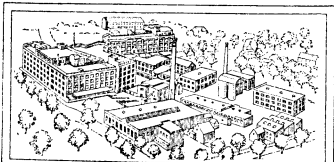
The word 'TABLOID' denotes a Burroughs Wellcome & Co. product and is applied to many classes of products.

The word 'TABLOID,' used when ordering, secures you a product of the same composition and activity always and everywhere.

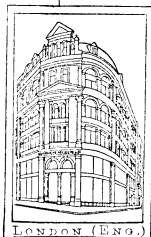
The word 'TABLOID' may not be used except with reference to a Burroughs Wellcome & Co. product.

BEWARE OF IMITATIONS

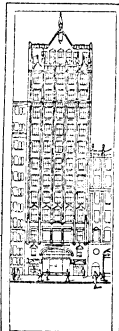
Offenders are prosecuted rigorously in the interests of photographers, dealers and the firm



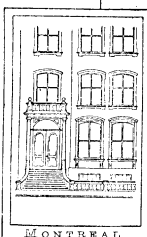
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LONDON (ENG.)



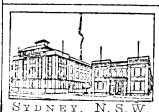
NEW YORK



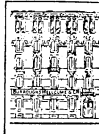
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SHANGHAI



SYDNEY, N.S.W.



MILAN



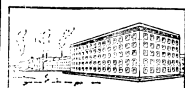
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RECORDS OF NEGATIVE EXPOSURES AND MEMORANDA

THE following pages, numbered 86 to 123, are arranged for recording details of those Special Negative Exposures of which you desire to preserve particulars.

An index may be kept on pages 100 and 101.

If you do not keep Exposure Records or do not need all the pages for this purpose, these pages may be used for Notes and Memoranda *re* Photographic and other matters.

THINGS YOU MAY NEED ON A PHOTOGRAPHIC TOUR

Camera	Measure or Graduate
Camera Case	Permits
Colour Filter	Plates
Compass	Ruby Lamp
Dark Slides	Screwdriver
Developing Dishes	Shutter Release
Films	Sling Strap
Film-Pack Adapter	'Tabloid' Developer
Focussing Cloth	'Tabloid' Desensitiser
Gummed Labels	'Tabloid' Hypo
Lens	Tripod
Level	Tripod Screw
Map	'Wellcome' Photographic Exposure Calculator

Measure with the horizontal lines, which are $\frac{1}{8}$ inch apart

Graflex Series
 # 179561

THE QUESTION
 OF EXPOSURE



Iris symbolises the rainbow in Greek mythology

THE quality of a negative is primarily dependent upon the exposure being correct. Considerable over-exposure is permissible, but under-exposure always results in poor quality, and often means entire loss of exposed plates and films. The following pages deal fully with the important question of Exposure. The photographer who makes full use of the data given and of the ingenious Exposure Calculator to be found at the end of this book is assured that every exposure will yield a negative of excellent quality, provided due regard is afterwards paid to the simple process of development recommended. The use of the Calculator takes the minimum of time and is simplicity itself.

INSTRUCTIONS

(1) Find the *Light Value* for the time of day and weather by consulting the Monthly Light Table facing the Calculator.

(2) Turn the revolving disc until the GREEN FIGURE representing the speed of the plate or film in use registers with the BLACK FIGURE which represents the *Light Value*.

The RED FIGURE opposite each stop is the shortest safe exposure for all Normal Subjects.

It is always safe to double this exposure.

'TABLOID' denotes—
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Example No. 1 (see Fig. 1, opposite)

May, 3 p.m. Dull.....LIGHT VALUE $3/4$
 Film or PlateFACTOR $1/8$
 Subject.....NORMAL SUBJECT (see below)
 Stop.....F 6 (U.S. 2)

Turn the revolving disc until the GREEN FIGURE "1/8" registers with the BLACK FIGURE "3/4" in the top shaded sector.

Then opposite f 6 (U.S. 2) you find the RED FIGURE "1/25," which means that the *shortest safe exposure* at f 6 (U.S. 2) is 1/25th of a second, and so on for all the other stops (see Figure No. 1, on facing page).

NORMAL SUBJECTS include—

Landscapes with average foregrounds or with full-length figures or animals.

Well-lighted Street Scenes.

Buildings of Normal Colour.

*Portraits in well-lighted room.

*Very light Interiors.

*Copying Paintings in Studio or Conservatory.

*Copying Photographs in well-lighted room.

NOTE.—Exposures are given in seconds or fractions of a second except for subjects marked with an asterisk, when they are in minutes or fractions of a minute.

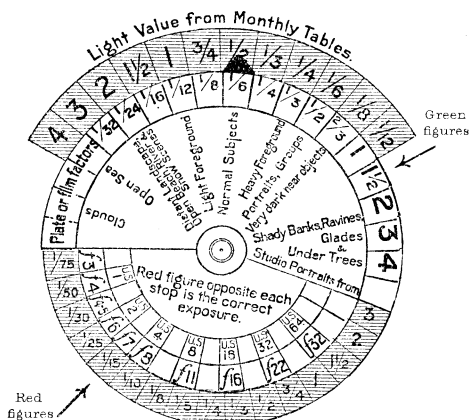


FIGURE NO. 1

FOR OTHER SUBJECTS

Proceed as described and, after the first movement has been made, note the position of the BLACK POINTER and turn the disc a *second time* until the subject to be taken points to the position where the pointer previously rested.

Then the **shortest safe exposure** for that subject is the RED FIGURE opposite each stop.

Example No. 2 (see Fig. 2, page 184)

May, 3 p.m. Dull.....LIGHT VALUE $3/4$
 Film or PlateFactor $1/8$
 Subject.....LIGHT FOREGROUND
 Stop.....F 8 (U.S. 4)

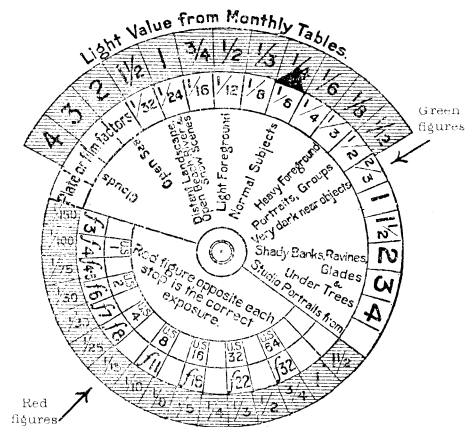


FIGURE NO. 2

Turn the revolving disc until the GREEN FIGURE "1/8" registers with the BLACK FIGURE "3/4" in the top shaded sector.

This is the position shown in Figure No. 1. Now note that the BLACK POINTER rests on the figure "1/2," therefore turn the disc a second time until the words *Light Foreground* point to the figure "1/2."

You then get the position as in Figure No. 2, and opposite *f* 8 (U.S. 4) you find the red figure "1/25," which means that the *shortest safe exposure* is 1/25th of a second at *f* 8 (U.S. 4), and so on for all other stops.

SINGLE SPEED SHUTTERS

Set the Calculator in the ordinary way for the light, plate or film and subject. Then see which stop comes opposite to the red figure 1/25 and make your exposure with that stop, or the next smaller stop if absolutely necessary.

You can use F 11 instead of F 8, or F 8 instead of F 6, and still get a fair if not *fully* exposed result, but if the Calculator says 1/25 second at F 6 and your largest stop is F 11, you *must* give a time or "bulb" exposure using F 16, or F 22 and resting your camera on some rigid support.

FURTHER POINTS ABOUT EXPOSURE

(1) Actinic Value of the Light

Four distinct conditions of light are recognised in the Monthly Light Tables.

Sun Shining Unobscured.—The sun is shining unobscured by cloud or mist; the sky may be either entirely cloudless, or there may be light clouds which do not obstruct the sun's rays.

Sun Obscured by Light Clouds or Slight Mist.—There are light clouds or a slight mist, but the light is still strong enough to throw a slight shadow. This condition is generally known as "Diffused Light." Even in the brightest weather it is advisable to use this column when working in large towns, to allow for loss of actinic power due to smoke, etc.

Dull or Misty.—The sky is covered with clouds or a mist sufficient to prevent the sun from throwing a shadow. This absence of shadow distinguishes the condition of light from that dealt with above.

Very Dull.—The whole sky is overcast with heavy, gloomy clouds.

LATITUDE

The actinic value of the light at different times of the day and year varies with the latitude (*see pages 211 and 212*).

ALTITUDE

Above a height of 5000 ft. it has been the custom of some workers to reduce the exposure slightly; others, however, contend that it should be increased. Much appears to depend on circumstances, and, with the great latitude of modern plates, it is a safe plan to adopt normal exposures, paying particular attention to the subject. Mountain views with near masses of dark rock or tree must be treated as heavy foreground subjects, in spite of the presence of snow in the middle distance.

(2) Subjects (see Illustrations)

The golden rule is to expose for the deepest shadows or the darkest object in which detail is required, and, therefore, the photographer must judge each subject by its shadows, especially those near the camera, or by the tone of foreground objects. The Exposure Calculator gives the correct exposure for *Normal Subjects* by one turn of the scale.

Normal Subjects (see illustration D).—LANDSCAPES WITH AVERAGE FOREGROUNDS, SUCH AS FOLIAGE, FIGURES AND BUILDINGS OF MEDIUM COLOUR; WELL-LIGHTED STREET SCENES, *PORTRAITS IN WELL-LIGHTED ROOMS, *VERY LIGHT INTERIORS, *COPYING PHOTOGRAPHS IN WELL-LIGHTED ROOM, *COPYING PAINTINGS IN STUDIO.

NOTE.—The Calculator gives the exposure in *seconds or fractions of a second*, except for those subjects with an asterisk. For these the exposure is in *minutes or fractions of a minute*.

If the foreground is heavy, give double the exposure; if light, give half

A second movement of the Scale (see instructions on the Calculator itself) indicates the correct exposure for the following special subjects:—

Clouds.—The exposure indicated for "Clouds" is for those of medium character. Heavy rain clouds require double this exposure; very light white clouds one half. Red or yellow sunset and sunrise clouds require longer exposures, unless orthochromatic plates are used.

TYPICAL SUBJECTS

These illustrations will help the photographer to classify his subject correctly



A—DISTANT LANDSCAPE SUBJECT

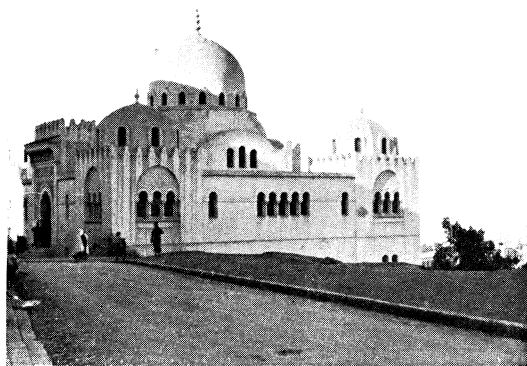
Requires one-quarter the exposure necessary for a normal subject



B—FOREGROUND BEACH SCENE

Requires one-half the exposure necessary for a normal subject

EXPOSURE



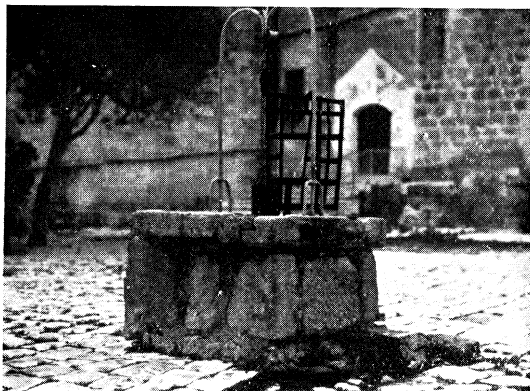
**C—OPEN FOREGROUND SUBJECT
(LIGHT BUILDINGS)**

Requires one-half the exposure necessary for a normal subject



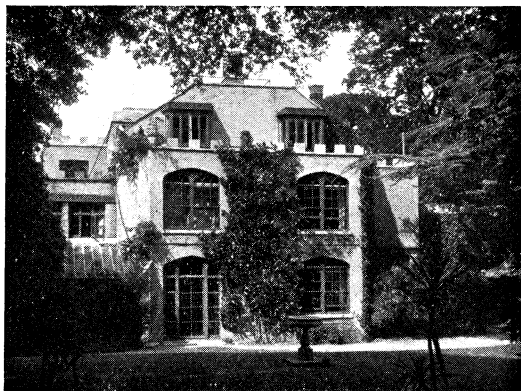
D—A TYPICAL NORMAL SUBJECT

EXPOSURE



E—HEAVY FOREGROUND SUBJECT

Requires twice the exposure necessary for a normal subject



**F—VERY DARK FOREGROUND
SUBJECT**

Requires four times the exposure necessary for a normal subject



**G—PORTRAIT GROUP
(LARGE SCALE FIGURES)**

Requires three to four times the exposure necessary for a normal subject



H—UNDER TREES, SHADY BANKS

Requires from eight to twenty-four times the exposure necessary for a normal subject

Open Sea, Distant Snow-clad Hills.—Open seascapes with no dark objects, such as rocks, boats, etc., in immediate foreground. Snow-clad distant hills without any masses of near shadow are also included in this class.

Distant or Panoramic Landscapes, Open Beach, River and Snow Scenes *without near dark objects*, **Glaciers, Ships, Yachts in the Open, and Aviators in Flight.**—These are very open subjects which reflect, or are surrounded by objects reflecting, a large amount of actinic light (*see illustration A*).

Light or Open Foregrounds (*see illustration C*).—Open streets, roads or fields, light buildings and views with figures or animals in the **middle distance**; also **foreground studies of beach scenes (B)**, boats and shipping. Athletic sports and inland views, in which there are no near dark objects or shadows.

Landscapes with Heavy Foregrounds, also badly-lighted street scenes, porches, harbours, close architectural subjects when dark in colour. Views with ordinary foreground figures come in this class, but, if the figures are very close to the camera, classify the subject as a "Portrait Group" (*see illustration E*).

Portraits and Portrait Groups and Very dark near Objects (*see illustrations F and G*). Also close-up animal studies and still-life and fruit studies out of doors.—These subjects require three or four times as much exposure as a normal subject, because of their proximity to the camera, and their tone.

Shady Banks, Ravines, Glades and under Trees (*see illustration H*).—In these instances, owing to the light being shut out to a greater or less extent, the exposure has to be increased from 8 to 24 times, or more in extreme cases.

Indoor Portraits.—For studio portraits there is a sector on the revolving disc. The same exposure may be given for portraits in the conservatory or *extremely well-lighted* room. In ordinary well-lighted rooms it is better to consider the subject a normal one and give the exposure indicated by the first turn of the Calculator,

but in fractions of a *minute* instead of fractions of a second (*see Normal Subjects*). If the room is not well-lighted or the subject is away from the window, expose as medium and dark interiors.

Copying.—In the Table on *page 202*, different kinds of copying are grouped under the subject headings printed on the Calculator, on the understanding that, if out of doors, the copy is placed in a well-lighted position but out of direct sunlight; if indoors, *in a well-lighted room near the window*. The exposure must be considerably increased if made in a poorly-lighted room or away from the window. For prints or engravings yellowed by age, increase the exposure or use orthochromatic plates. This also applies to paintings containing much yellow or red. Photographs of a purple or purple-black colour require less exposure than those which are browner in colour. For smaller or larger copies, *see page 193*.

Still-Life Studies, Flowers, Fruit, etc.—Classifications for these subjects are given on *page 202*. They are calculated for use in photographing flowers, fruit, etc., so as nearly to fill the plate in use.

Interiors.—Average classifications are given in Table A (*page 202*). Another method of estimating the time necessary for interiors is given on *page 191*.

(3) Plate or Film Factors—Table B (pages 204–210)

These factors are given in order to enable photographers to estimate correct exposure by means of the 'WELLCOME' EXPOSURE CALCULATOR.

They are exposure factors, rather than speed factors, because the aim is to indicate a safe exposure within practical limits. They do not of necessity indicate the precise relationship in speed of one plate to another.

(4) Lens Aperture

Lens stops are marked by numbers on two common systems—the "F" and the "U.S." (Uniform) Systems. The *f* number is arrived at by dividing the focal length of the lens by the diameter of the stop. Thus, a 1/2-inch stop in a 4-inch lens is *f* 8, or a 1/2-inch stop in an 8-inch lens is *f* 16. This relationship must be borne in mind

when using either the back or front of a convertible lens separately.

The table on *page 190* gives the U.S. numbers which correspond to *f* values in common use, and also indicates the relative speeds of *f* value stops, taking *f* 8 as the unit. This table should be carefully studied by the beginner who wishes to understand fully the use of the various stops with which his camera is provided.

Cameras fitted with single achromatic lenses generally have four stops, marked 1, 2, 3 and 4. In this case No. 1 is usually *f* 14, No. 2 *f* 16, No. 3 *f* 22, No. 4 *f* 32. In V.P.K. single lens cameras, stops are No. 1 *f* 11, No. 2 *f* 16, No. 3 *f* 22, but usually when three stops only are marked on any camera they should be taken as *f* 14, *f* 22, *f* 32.

EXPOSURE FOR CINÉ PHOTOGRAPHY

The 'Wellcome' Exposure Calculator is simple to use and unexcelled when making exposures with ciné cameras.

The exposure in ciné photography being adjusted by the size of the stop, and the shutter speed remaining constant at normal cranking (the average shutter speed is from 1/25 sec. to 1/30 sec.), correct exposure of the film is found as follows:—

The Light Value for the prevailing conditions and the film speed are ascertained from the tables and the Calculator disc set. The stop indicated opposite 1/25 sec. is then the correct stop to employ for normal subjects. For other subjects, a second turn of the disc is necessary as for still photography.

Example

Light Value 1/3, Ciné Film 1/8, Normal Subject. Turn the disc until green figure 1/8 registers with black figure 1/3; the stop opposite 1/25 we find is *f* 8. This is the correct stop to use under the conditions for a normal subject. If, however, we are working on "Very near dark objects," move that section of the Calculator to where the black pointer previously rested, and we find it necessary to open up to *f* 4 to get a well-exposed film.

LENS APERTURES

To avoid confusion, only the stops generally in use are marked on the Calculator disc; the Table below indicates the relative values of those omitted:—

Stops F values	Relative Ex- posures	U.S. Nos.	Positions on Exposure Calculator
f 1	1/64	0.06	} as indicated by f 4 divided by 16
f 1.4	1/32	0.125	
f 2	1/16	0.25	} as indicated by f 4 divided by 4
f 2.8	1/8	0.5	
f 3.2	3/8	0.75	} as indicated by f 3
f 3.5			
f 4	1/4	1	} as indicated by f 4
f 4.5	1/3	1.5	
f 5.6	1/2	2	as indicated by f 6
f 6			} as indicated by f 7
f 6.3	5/8	2.48	
f 6.8			} as indicated by f 7
f 7	3/4	3	
f 8	1	4	} Between f 8 and f 11
f 9	1 1/4	5	
f 10	1 1/2	6.25	} Between f 8 and f 11
f 11.3	2	8	
f 12.5	2 1/2	10	} Between f 11 and f 16
f 14	3	12.25	
f 16	4	16	} Between f 16 and f 22
f 18	5	20	
f 20	6	25	} Between f 16 and f 22
f 22.6	8	32	
f 25	10	39	} Between f 22 and f 32
f 28	12	49	
f 32	16	64	

The exposure with any particular stop may be calculated by multiplying the exposure at f 8 (U.S. 4) by the figure in the second column of the Table above.

NOTE.—When necessary to ensure ease in calculating, approximate figures are given.

For single lens cameras with stops marked 1, 2, 3 and 4, see page 189.

EXPOSURES FOR INTERIORS

Focus the subject, using the lens at its full aperture. Wait until the eyes have become fully accustomed to the subdued light, and then, without moving the head from under the focussing cloth, slowly stop down the lens until the detail in the darkest object in which detail is required can be faintly (but distinctly) seen when the eyes are directly opposite that portion of the ground glass. Note the stop and refer to the table below:—

Stop to be used for exposure	Aperture at which detail can just be seen						
	F 64	F 45	F 32	F 22	F 16	F 11	F 8
	U.S. 256	U.S. 128	U.S. 64	U.S. 32	U.S. 16	U.S. 8	U.S. 4
	min.	min.	min.	min.	min.	min.	min.
F 64 U.S. 256	40	80	160	320	640	—	—
F 45 U.S. 128	20	40	80	160	320	640	—
F 32 U.S. 64	10	20	40	80	160	320	640
F 22 U.S. 32	5	10	20	40	80	160	320
F 16 U.S. 16	2 1/2	5	10	20	40	80	160
F 11 U.S. 8	1 1/4	2 1/2	5	10	20	40	80
F 8 U.S. 4	40	1 1/4	2 1/2	5	10	20	40

In the column under the aperture at which detail can just be seen, and opposite the stop to be used, will be found the approximately correct exposure for any plate having a factor of 1 in Table B (see pages 204-210). For instance, supposing detail in the shadows can just be seen when the lens has been stopped down to F 45 (U.S. 128), then the exposure, using an aperture of F 16 (U.S. 16), will be five minutes.

For more rapid plates give one-half, one-third, one-quarter or less, in accordance with the factors given in Table B (see pages 204-210).

This method may also be employed when taking portraits or photographing still-life subjects indoors.

EXPOSURES IN TELEPHOTOGRAPHY

For Distant Objects

Find the normal exposure for the ordinary lens and stop by using the Calculator in the usual way, carefully bearing in mind that the subject generally comes under the heading of PANORAMIC LANDSCAPE (see pages 187 and 202). It may, however, come under the heading of Open Seascapes or Distant Snow-clad Hills. Multiply this exposure by the magnification squared. Thus, if the ordinary exposure for a distant landscape is 2 sec. F 16 (U.S. 16), it will be $2 \times 5 \times 5 = 50$ seconds, with a telephoto attachment giving a magnification of 5, and using the same stop in the positive lens. With some telephoto attachments the degrees of magnification are stated on the mount or elsewhere. If not so stated, the magnification may be found as shown below.

For Nearer Objects

Proceed as above, altering the SUBJECT FACTOR on the Calculator in accordance with circumstances. For middle distance views OPEN FOREGROUND may be used, and for near objects STRONG FOREGROUND.

To find Magnification

Focus the subject to the size desired, and measure the distance from the back of the negative lens to the screen. Divide this distance by the focal length of the negative lens, and add 1. Thus, with a camera extension of 24 in. and a negative lens of 3 in. focus, the magnification will be $24 \div 3 = 8$. $8 + 1 = 9$ times.

Other Calculations

The following are not necessary for ascertaining the exposure if the above method be followed, but give details which may be required for other purposes:—

TO FIND THE FOCAL LENGTH OF A TELEPHOTO COMBINATION.—Multiply the focal length of the positive (ordinary) lens by the magnification.

TO FIND THE f VALUE OF A TELEPHOTO COMBINATION.—Multiply the f number of the stop used in the positive lens by the magnification, *i.e.* $f/8 \times 4 = f/32$.

EXPOSURES FOR COPYING
ENLARGING OR REDUCING

The exposures for copying the same size (see page 202) are at once obtainable by using the 'WELLCOME' EXPOSURE CALCULATOR. For other sizes the following Table must be used:—

Proportion of image to original	Factor	Proportion of image to original	Factor
Reducing to $1/30$..	0.27	Diam.	
" $1/20$..	0.28	Enlarging to 4 ..	6.25
" $1/10$..	0.3	" $4\frac{1}{2}$..	7.5
" $1/8$..	0.31	" 5 ..	9
" $1/6$..	0.34	" $5\frac{1}{2}$..	10.5
" $1/4$..	0.39	" 6 ..	12.25
" $1/2$..	0.56	" 7 ..	16
" $3/4$..	0.76	" 8 ..	20.25
Same size	1 ..	" 9 ..	25
Diam.		" 10 ..	30.25
Enlarging to $1\frac{1}{2}$..	1.5	" 11 ..	36
" 2 ..	2.25	" 12 ..	42.25
" $2\frac{1}{2}$..	3	" 13 ..	49
" 3 ..	4	" 14 ..	56.25
" $3\frac{1}{2}$..	5	" 15 ..	64

To use the Table for Copying

Find the correct exposure for copying the same size, and then multiply this by the factor opposite the size required.

For Enlarging or Reducing

This table is also of service when using an enlarging or reducing camera. Having found the correct exposure for enlarging or reducing to any given size, it is easy to find the exposure for any other size under the same conditions.

Multiply by the figure opposite to the size desired, and divide by that opposite to the size for which the exposure is known.

Thus, if the exposure when enlarging 3 diameters ($4\frac{1}{2} \times 3\frac{1}{2}$ to 12×10) is 60 seconds, that for enlarging 5 diameters ($4\frac{1}{2} \times 3\frac{1}{2}$ to 60×15) will, under the same circumstances, be $\frac{60 \times 9}{4} = 135$ seconds.

EXPOSURES FOR MOVING OBJECTS

The following table gives, in round figures, the shutter speeds necessary to secure negatives sufficiently sharp for direct printing when taking moving objects with a lens of about 5 in. focus. Column **D** is for objects moving *directly towards or away from the camera*; **O** for objects moving *obliquely towards or from the camera*; **A** for objects moving *directly across* the camera.

The figures are no guide to what is the correct exposure for the plate.

Distance of Object, 25 feet, unless otherwise stated			
	D	O	A
Street groups (no rapid motion) ..	1/5 to 1/10		
Pedestrians (two miles per hour) } Animals grazing }	1/20	1/40	1/60
Pedestrians (three miles per hour) ..	1/80	1/60	1/90
Pedestrians (four miles per hour) ..	1/40	1/80	1/120
Vehicles (six miles per hour) ..	1/60	1/120	1/180
Vehicles (eight miles per hour) ..	1/80	1/150	1/250
Cyclists and trotting horses ..	1/160	1/300	1/500
Foot races and sports ..	1/240	1/500	1/700
Divers	—	1/600	1/800
Cycle races, horses galloping ..	1/300	1/750	1/900
Yachts (speed 10 knots) at 50 ft. ..	1/60	1/120	1/180
Steamers (speed 20 knots) at 50 ft. ..	1/120	1/240	1/360
Football, 50 ft.	1/125	1/250	1/500
Trains, Motors, Speed Boats, etc. (20 to 30 miles per hour) at 50 ft. ..	1/150	1/300	1/450
Ditto (40 to 60 miles per hr.) at 50 ft. ..	1/300	1/600	1/900
Flying birds, 50 ft.	1/250	1/500	1/1000
Aeroplanes (100 miles per hour) at 100 ft.	1/300	1/600	1/900

At 50 ft. the exposure may be double that at 25 ft.

At 100 ft. the exposure may be double that at 50 ft.

and so on.

NOTE.—For lenses of greater or less focal length than 5 in., multiply above figures by 5, and divide by the focal length of the lens in inches.

EXPOSURES FOR OUTDOOR
PHOTOGRAPHY AT NIGHT

It is, of course, impossible to give exact figures for photography at night, since so much depends upon the nature of the subject, the amount of artificial light present, and other conditions. The following table, therefore, merely *suggests* exposures as a basis for trial.

The figures given are for the following conditions:—Any plate the factor of which is given as 1/4 in Col. I., Table B.—Plate Factors (*see pages 204-210*). Time, about two hours after sunset.

SUBJECT	F 8	F 11	F 16
	U.S. 4	U.S. 8	U.S. 16
Shop Fronts, brightly lighted	min. 1½	min. 3	min. 6
*Illuminated Grounds or Buildings	3	6	12
*Open Street Scenes, without near dark masses	6	12	24
Ditto, with snow on ground, or wet pavements	4½	9	18
*Street Scenes, with near dark masses	12	24	48
Ditto, with snow on ground, or wet pavements	9	18	36

If using plates of greater or less speed than 1/4 the exposures must be adjusted accordingly.

*These subjects, illuminated by floodlights only, require three to six times the exposure indicated above.

EXPOSURES BY ARTIFICIAL LIGHT

A simple method of calculating exposures, using artificial light, is given below and applies to plates of normal colour sensitivity. Using special colour sensitive plates that are faster to half watt lighting than to daylight, the exposures indicated below should be decreased accordingly.

Standard Exposure

Plate ..	Factor 1/16	Stop ..	$f/8$ (U.S. 4)
Light ..	One 60 watt gas-filled electric lamp*		
Distance ..	6 feet		
Subject ..	Still-life study of medium and light tones		
	—in small room with light wall-paper		
Exposure ..	50 seconds (minimum)		

Varying Conditions

1.—Plate Variations

(See Table B, pages 204-210)

Factor 1/8 multiply standard exposure by 2

" 1/12 " " " " $1\frac{1}{2}$

" 1/24 " " " " $2\frac{3}{4}$

2.—Stop Variations

(See page 190)

$f/4$ (U.S. 1) multiply standard exposure by $1/4$

$f/5.6$ (U.S. 2) " " " " $1/2$

$f/6.3$ (U.S. 3) " " " " $5/8$

3.—Distance of Light

Remember the light varies as the *square* of the distance; for example, the exposure at a distance of 12 feet must be *four* times that at 6 feet.

4.—Reflecting Surfaces

If the wall-paper is dark in colour, multiply exposure by 4; if medium, multiply by 2.

Example, under the following conditions:—

Plate Factor 1/16

Stop $f/5.6$ (U.S. 2)

Light distance 12 feet

The exposure would be 50 seconds $\times 1/2$ (for stop) $\times 4$ (for distance) = 100 seconds.

*As the candle-power of electric lamps varies according to wattage, information on this point must be obtained from the lamp manufacturer. A 60 watt lamp as above equals approx. 45 candle-power. An incandescent gas burner equals approx. 30 candle-power

2. FLASHLIGHT

The table below indicates approximate amounts of smokeless flash powder or pure magnesium powder, using a plate with a factor of 1/16 and stop $f/8$.

Distance	Most Active Flashlight Mixture*	Magnesium Powder
6 feet	5 grains	15 grains
12 feet	15 grains	40 grains
24 feet	35 grains	105 grains
36 feet	45 grains	180 grains

For other conditions proceed as follows, using the 'WELLCOME' CALCULATOR at the end of this book:—

Place green figure 1/16 opposite to figure 1 in the Light Value Scale, read off the figure opposite factor for the plate in use, divide the number of grains in the table above by this figure, and the answer is the number of grains of powder to be used at $f/8$ (U.S. 4).

EXAMPLE.—Ultra-rapid plate, factor 1/12 (Table B, page 204-210). Place 1/16 opposite to 1 in Light Value Scale, and opposite 1/12 we find $3/4$. Therefore, at 12 ft. we get $15 \div 3/4 = 20$ grains of flashlight mixture at $f/8$ (U.S. 4), or $40 \div 3/4 = 53$ grains of pure magnesium powder. If using $f/5.6$, use only half this quantity of powder; if using $f/11$, use double; and so on in accordance with page 190.

3. ELECTRIC FLASHLIGHT

The following table will serve as a guide to the use of lamps of this nature and is based on the use of a single lamp and reflector. The flash lasts approximately 1/50 to 1/75 of a second.

Stop	Factor 1/8	Factor 1/12
$f/3.5$	41 ft.	52 ft.
$f/4.5$	32 ft.	40 ft.
$f/6.3$	23 ft.	30 ft.
$f/8$	17 ft.	21 ft.
$f/11$	11 ft.	14 ft.

*NOTE.—These figures are subject to variation, in accordance with the make or grade used. They may be increased if necessary.

DEVELOPMENT PAPERS (continued)

Ilford Bromide Soft ..	1½	Kodak Translite..	100/800
" " Normal	1	" " Azo No. 1..	230
" " Medium	2	" " No. 2..	350
" " Contrasty	1½	" " No. 3..	530
" " Ex.	4½	" " No. 4..	1000
" " Contrasty	4½	" " No. 5..	1100
" " Clorona	12	Kosmos Bromide (all varieties except as below)	2
Kentmere KK ..	512	" Vitegas Normal and	10
" " KG ..	512	" " Contrasty	10
" " KB ..	2	" Vitegas Soft	4
" " Exhibition	2	" Vitegas Contrast	12
" " MC ..	2	Lumière Lypaluxe ..	1
" " FC ..	3	" " Lypa Normal	3
Kodak Bromide Soft and Contrast	1½	" " Contrast	31
" " Medium ..	2	" " Rapid..	½
" " "Kodura and Kodesko"	25	" Rhoda ..	172
" " Kovita ..	3	" Rholuxe ..	172
" " Etching Brown	200	Modela ..	64
" " Kothena ..	4500	Novex Normal & Soft	688
" " Velox Soft ..	300	" " Vigorous ..	1024
" " "Medium	200	Radiant Gaslight	256
" " "Vigorous	400	" " Bromide ..	½
" " P.M.C. Bromide Normal	2	Scala (all varieties)	3
" " P.M.C. Bromide Contrast	5	Selo Gaslight Vig. ..	1025
" " Portrait Bromide	2	" " Normal	800
" " Kodaline ..	2	" " Soft ..	700
" " Vitava B 2 ..	20	" " Extra Soft	500
" " " B 3 ..	20	Star Bromide Normal	6
" " " B Opal	35	" " Brilliant	12
" " " Athena	500	" " Contrast	24
" " "Rapid Black	40	Vitegas Normal ..	6
		" " Contrast ..	12

LANTERN PLATES

Apem Black Tone ..	3	Ilford Alpha ..	500
" " Warm and "Chautona"	32	" " Gaslight ..	400
Austral Lantern ..	12	" " Warm Black ..	20
" " Nepera ..	500	Illingworth "Slogas" Lantern	512
Barnet Cold Tone ..	16	" " Black Tone	3
" " Warm Tone ..	4	Imperial Special ..	4
" " Contact Gaslight	192	" " Gaslight Black Tone	36
Bauchet Warm Black	6	" " " Warm ..	48
" " Sepia and Red	704	Lumière and Jougla Transparency Black Tone ..	8
Cappelli Black Tone	96	Lumière and Jougla Transparency Warm Tone ..	24
" " Warm Tone	4	Marion Chloro-Bromide	4
Central Contrast Transparency	1	Paget Rapid ..	6
Cramer Lantern and Transparency	3	" " Slow ..	16
Criterion Special ..	4	" " Gravura (Gaslight)	96
" " Mezzotone	12	Rajar Black Tone ..	6
" " Bygas (Gaslight)	752	" " Warm Tone ..	48
Eastman Lantern ..	6	Salex Black Tone ..	6
" " Positive Film	2	" " Warm Tone ..	96
Gevaert Black Tone..	2	Seed ..	3
" " " Hard	32	Standard Regular ..	3
" " WarmTone..	36	" " Slow ..	4
Granville Gaslight ..	20	Wellington ..	1
" " Special ..	12	" " Mezzotint..	22
" " Semitone ..	100	" " S. C. P.	
Grieshaber "Varieta"	6	(Gaslight)	782
Hammer, Yellow Label	3		
" " White Label	2		
Hauff ..	4		
Ilford Special..	3		

TABLE A.—SUBJECTS

(For details and illustrations, see pages 186 to 188)

In this Table a number of subjects are grouped under the shortened titles used on the Calculator itself.

Clouds.

Open Sea—Open Seascapes without near dark objects,
Distant Snow-clad Landscapes.

Distant Landscape, Open Beach, River and Snow Scenes—Ships in the Open, Aeroplanes in Flight.

Light or Open Foreground—Open Streets, Roads and Fields with figures or Animals in middle distance, Fore-ground Beach Scenes, Light Buildings, Copying Black and White subjects outdoors.

NORMAL SUBJECTS:

Landscapes with average foregrounds or with full-length figures, Well-lighted Street Scenes and Buildings, *Portraits in Well-lighted Room, *Copying Paintings in Studio, *Copying Photographs in Room, *Very Light Interiors.

Heavy Foreground—Badly-lighted Street Scenes, Dark Buildings, Figures or Animals near camera, *Copying Paintings in Room.

Portraits—Portraits (full length) or Portrait Groups outdoors, Copying Black and White in Studio or Conservatory, *Flowers, Still Life or Fruit in Room.

Very Dark near Objects—Head and Shoulder Portraits outdoors, Close-up Animal Studies outdoors, Still Life and Fruit Studies outdoors, Copying Photographs Outdoors, *Light Interiors.

Shady Banks, Ravines, Glades—Views under Trees, Copying Paintings outdoors, Copying Black and White in Room, *Medium Interiors.

Studio Portraits—Still Life, Flowers, Fruit, etc., or Copying Photographs in Studio or Conservatory, *Dark Interiors.

Flashlight Subjects (see page 197).

* For subjects marked with an asterisk, read exposure as minutes or fractions of a minute.

All copying same size. For other sizes, see page 198.

EQUIVALENT PLATE NUMBERS

'Wellcome,' Watkins and Wynne Systems

The 'Wellcome' factors are exposure factors and not what are generally known as plate speeds. A plate marked 1/8 may safely be given 1/8 the exposure of that marked 1 and so on. The Watkins and Wynne numbers are those issued by these authorities and do not always agree in value with the figures quoted by plate and film makers. As H. and D. numbers vary according to the different methods of testing, used to ascertain these numbers, a list is not included. The standard H. and D. numbers may be found by the following formula $\frac{20}{\text{'Wellcome' factor}}$. As with the Watkins and Wynne figures the standard H. and D. numbers will not always agree with those quoted by manufacturers.

'Wellcome' (Table B, Col. I.)	Watkins	Wynne	'Wellcome' (Table B, Col. I.)	Watkins	Wynne
16	2	F 10	2/3	45	F 45
12	3	F 11	1/2	60	F 56
8	4	F 14	1/3	90	F 64
6	6	F 16	1/4	120	F 78
4	8	F 20	1/6	180	F 90
3	12	F 23	1/8	240	F 111
2	15	F 28	1/12	360	F 128
1½	20	F 32	1/16	480	F 156
1	30	F 39	1/24	720	F 181

TABLE B.—PLATES AND FILMS

This table has been compiled to guide photographers to correct exposure and development.

COLUMN I. is for use in calculating the shortest exposure required to obtain satisfactory negatives. Double this exposure may always be given with safety and often with advantage, particularly in the case of self-screen and other ortho plates, when it is desired to obtain the full advantage of their colour sensitiveness.

COLUMN II. is for use in calculating the shortest exposures which may be given with any hope of success. It should never be used unless circumstances make it essential.

COLUMN III. has nothing to do with exposure. It indicates into which class a plate falls so far as speed of development is concerned, and is intended for use with the Time Tables for Development given on pages 17-22.

NOTE.—These exposure factors are for daylight use only.

	Col. I.	Col. II.	Col. III.
Agfa Plenachrome Plate ...	1/24	1/32	B
" " Portrait Film ...	1/24	1/32	B
" " Roll Film ...	1/16	1/24	A
" " Film Pack ...	1/16	1/24	A
" Extra Rapid Plate ...	1/12	1/16	A
" Chromo Isorapid ...	1/16	1/24	N
" " Isolar ...	1/6	1/8	N
" Commercial Contrast Film ...	1/6	1/8	N
" Process Film and Plate ...	3	—	N
" Com. Orthochro. Film ...	1/6	1/8	N
" Normal Plate ...	1/6	1/8	N
" Special Rapid Panchro. Plate	1/24	1/32	A
" Roll Film and Pack ...	1/8	1/12	A
" Super Speed Portrait Film ...	1/16	1/24	B
" Panchromatic Film... ...	1/16	1/24	B
" Super Pan. Roll Film ...	1/24	1/32	B
" *Colour Plate... and Pack	3	—	—
Austin Edwards, Standard and Portrait	1/8	1/12	B
" " Super Speed ...	1/16	1/24	B
" " Frena Film ...	1/8	1/12	A

*Factor allows for plate and filter

TABLE B.—PLATES AND FILMS (contd.)

	Col. I.	Col. II.	Col. III.
Barnet, †Ordinary... ..	1/2	1/4	N
" Process Pan.	1/2	1/4	N
" Special Rapid	1/6	1/8	N
" Process & Process Ortho	1	—	A
" †Self-Screen	1/6	1/12	N
" Red Seal	1/8	1/12	A
" Special Rapid Pan. ...	1/12	1/16	N
" Studio Ortho	1/8	1/16	N
" Studio 500	1/12	1/24	B
" Ultra Rapid	1/16	1/24	B
" †Super Speed Ortho ...	1/12	1/16	A
" †XL Super Speed Ortho	1/16	1/24	B
" Studio 650	1/16	1/24	A
" Press	1/16	1/24	B
" Summer Press	1/16	1/24	B
" Portrait Film	1/12	1/16	B
" Super Press	1/24	1/32	B
" Soft Panchro.	1/16	1/24	B
Central Process	2	1	N
" Colornon	1	1/2	N
" Xactone	1	1/2	A
" Commercial and Panchro.	1/2	1/4	N
" Comet	1/3	1/4	N
" Postal & Spec. Non-Hal.	1/6	1/8	A
" Special XX	1/8	1/12	A
Cramer Inst. Iso	1/8	1/12	A
" Sure Shot	1/16	1/24	B
" Crown	1/12	1/16	A
" Postal	1/12	1/16	A
" Hi-speed	1/16	1/24	B
" Contrast and Process ...	2	—	D
" Slow Iso	1	—	D
" Commercial	1/4	1/6	N
" 25, Commercial	1/4	1/6	N
" Spectrum	1/6	1/8	N
" Press	1/12	1/16	A
" Iso Presto... ..	1/24	1/32	B
" Med. Iso	1/6	1/8	N
" Banner x	1/12	1/16	A
" Spectrum Process	1/2	1/3	N
" Iso Process	1/4	1/6	N
" Super Contrast	1/4	1/6	N
Criterion Process	3	—	D
" Ordinary	1/2	1/4	N
" Extra Rapid	1/3	1/6	A

Matt-Emulsion, same speed

TABLE B.—PLATES AND FILMS (contd.)

	Col. I.	Col. II.	Col. III.
Criterion Iso Extra Rapid ...	1/4	1/8	N
„ Special Extra Rapid ...	1/6	1/12	B
„ Enelite and Enelite Iso	1/12	1/16	B
„ Press ...	1/8	1/12	N
„ Popular R.S.O. ...	1/8	1/12	N
Defender Pan. X-Fast ...	1/24	1/32	B
„ Pan. ...	1/12	1/16	N
„ „ Portrait ...	1/8	1/12	N
„ „ Com. Ortho ...	1/8	1/12	A
„ „ Commercial ...	1/8	1/12	N
„ „ Ensign Lukas ...	1/12	1/16	B
Eastman and Kodak— <i>Films</i>			
Supersensitive Panchromatic	1/24	1/32	B
Portrait Panchromatic ...	1/16	1/24	A
Verichrome Film ...	1/16	1/24	B
Super Speed Portrait ...	1/16	1/24	B
Par Speed Portrait ...	1/12	1/16	B
Ortho Press ...	1/12	1/16	A
Commercial Panchromatic	1/12	1/16	N
N. C. Film and Film Pack	1/8	1/12	B
Commercial Ortho ...	1/8	1/12	A
Commercial ...	1/8	1/2	N
„ „ Matte ...	1/8	1/2	N
Process Panchromatic ...	1-1/2	—	C
Positive ...	2	—	—
Eastman and Kodak— <i>Plates</i>			
Hyper Press ...	1/24	1/32	B
50 ...	1/16	1/24	B
40 ...	1/12	1/16	B
Polychrome ...	1/8	1/12	A
Universal ...	1/8	1/12	A
D. C. Ortho ...	1/8	1/12	N
S. C. Ortho ...	1/8	1/12	N
Post Card Plate ...	1/6	1/8	N
Commercial ...	1/6	1/8	N
33 and Ordinary ...	1/4	1/2	N
Process ...	1-1/2	—	C
*Finlay Colour Plate ...	1/3	1/4	B
Gevaert Ortho Process ...	2	—	D
„ Ordinary ...	2/3	1/3	N
„ Ortho Anti-Halo ...	1/4	1/8	N
„ Filtered Ortho ...	1/4	1/8	A
„ Special Rapid ...	1/6	1/8	N
„ Special Sensitive ...	1/8	1/12	N

*Factor allows for filter

TABLE B.—PLATES AND FILMS (contd.)

	Col. I.	Col. II.	Col. III.
Gevaert Chromosa... ..	1/6	1/8	A
„ Ortho Sensima	1/12	1/16	N
„ Super Sensima Spec. ...	1/16	1/24	B
„ Super Chromosa Press ...	1/16	1/24	B
„ Sensima 500	1/8	1/12	B
„ Roll Film and Film Pack	1/8	1/12	B
„ Superchrom Roll Film			
„ „ and Pack	1/24	1/32	B
„ S.S. 2000 H & D ...	1/24	1/32	B
Graflex Roll Holder Film ...	1/8	1/12	B
Hammer Ultra Rapid Press Plate	1/24	1/32	B
„ Aurora S.D.C.	1/12	1/16	N
„ Special Non-Hal.			
„ Ortho D.C.	1/12	1/16	A
„ Special (Record) ...	1/12	1/16	B
„ Photo Pastal Plate ...	1/8	1/12	N
„ Aura D.C.	1/8	1/12	N
„ Non-Hal. D.C. Ortho... ..	1/8	1/12	N
„ Ortho Fast	1/8	1/12	A
„ Extra Fast	1/8	1/12	A
„ Med-Speed-Com.	1/4	1/6	N
„ Com. Ortho	1/3	1/4	N
„ Slow Ortho	1/3	1/4	N
„ Slow	1/3	1/4	N
„ Process Plates	3	—	N
„ New Process	3	—	N
Hauf Extra Rapid and Ortho	1/6	1/8	N
„ Flavin	1/6	1/8	N
„ Ortho Non-Hal.	1/4	1/6	N
„ Ultra Rapid... ..	1/6	1/12	N
„ Roll Film and Film Pack	1/8	1/12	B
„ Analo Flavin	1/6	1/8	N
„ Ulcroma	1/16	1/24	B
„ Ultra Rapid Roll Film	1/16	1/24	B
„ „ Film Pack	1/16	1/24	B
„ Modula	1/24	1/32	B
Ilford— <i>Films</i>			
Process	1	—	D
Commercial Ortho	1/6	1/8	N
Portrait Medium Speed ...	1/8	1/12	B
Panchromatic	1/12	1/16	A
Portrait Ortho Fast	1/16	1/32	B
Hyperchromatic	1/24	1/32	B
Ilford— <i>Plates</i>			
Process	1	—	D
Half-tone	1	—	D
Fine Grain Ord.	3/4	—	D

TABLE B.—PLATES AND FILMS (contd.)

	Col. I.	Col. II.	Col. III.
Ilford—Plates (continued)			
Ordinary	2/3	—	C
Rapid Process Pan.	1/3	—	D
Empress	1/2	1/4	C
Chromatic	1/4	1/8	N
Special Rapid	1/6	1/8	N
Screened Chromatic	1/6	1/8	N
Rapid Chromatic	1/8	1/12	N
Auto-Filter	1/8	1/12	N
Press Ortho	1/12	1/16	A
Zenith	1/12	1/16	A
Special Rapid Pan.	1/12	1/16	N
Iso Record	1/16	1/24	A
Record	1/16	1/24	B
Iso-Zenith	1/16	1/24	B
Soft Gradation Pan.	1/16	1/24	B
Press (New Series)	1/16	1/24	A
Double X Press	1/24	1/32	A
Golden Iso-Zenith	1/24	1/32	B
Hypersensitive Pan.	1/32	1/48	B
Illingworth, Fleet	1/12	1/16	A
Fleet Panchro.	1/16	1/24	B
Super Fleet	1/16	1/24	B
Super Fleet Ortho	1/16	1/24	B
Imperial, Process	2	—	D
Fine Grain Ordinary	1	1/2	D
Ordinary	2/3	1/3	N
Special Rapid	1/6	1/8	N
Ortho Special Rapid	1/6	1/8	A
Non-Filter	1/6	1/8	C
" (New Series)	1/12	1/16	N
Panchromatic B	1/8	1/12	A
Panchro. Film Pack and Roll Film	1/8	1/12	N
Panchro. Process	1/4	1/8	D
Special Sensitive	1/8	1/12	N
" Sensitive Ortho	1/8	1/12	C
S. S. S. Press	1/16	1/24	B
Eclipse 650 H. & D.	1/16	1/32	B
" Soft and Ortho " Soft 850 H. & D.	1/24	1/32	B
Eclipse Soft Panchro.	1/24	1/32	B
Kodak (see Eastman)			
Lumière, Blue Label	1/6	1/8	N
" Micro	1/6	1/8	N
" Sigma Plate	1/8	1/12	A

TABLE B.—PLATES AND FILMS (contd.)

	Col. I.	Col. II.	Col. III.
Lumière, Gradua	1/12	1/16	A
" Violet Label	1/16	1/24	A
" Opta	1/16	1/24	A
" *Autochrome-Outdoors	8	—	—
" *Filmcolour	8	—	—
" S.E. Ortho No Screen	1/6	1/8	N
" Panchro. Process	1/6	1/8	C
" Chroma V.R.	1/12	1/16	A
" " V. and R.	1/8	1/12	N
" Micro Panchro.	1/12	1/16	N
Mimosa Fine Grain, Roll Film and Pack	1/8	1/12	B
" Extrema, Roll Film and Pack	1/16	1/24	B
Perutz Green Seal	1/12	1/16	A
" Panchromatic	1/12	1/16	A
" Fine Grain	1/16	1/24	A
" Persenso	1/24	1/32	B
Seed 27	1/16	1/24	A
" L. Ortho & 26x	1/12	1/16	N
" Non-Halation Ortho	1/12	1/16	N
" Panchromatic	1	—	N
" 23	1/2	1/3	N
" Process	2	—	N
Selo Roll Film	1/12	1/16	A
" Panchromatic	1/24	1/32	B
Selochrome	1/16	1/24	B
Standard Extra Imperial	1/12	1/16	N
" Orthonon	1/12	1/16	N
" Postcard	1/4	1/6	N
Stanley Regular	1/12	1/16	N
Voightlander Sigrid	1/8	1/12	N
" Sigurd	1/8	1/12	N
" Satrap	1/16	1/24	A
" Illustra	1/24	1/32	B
Wellington Ortho Process	1	—	D
" Spectrum	1/12	1/16	C
" Xpress	1/24	1/32	B
" Soft Spect.	1/24	1/32	N
Wratten Hypersen. Pan.	1/24	1/32	A

*NOTE.—Factor allows for Plate and Filter. For Autochrome plates, use the Green Figure I on the Calculator, and multiply the exposure by 8 for outdoor exposures. For indoor or dull light exposures with all colour plates, give double the exposure indicated by Calculator for outdoor exposures.

Northern Hemisphere

THE following Monthly Light Tables are calculated for 40° and for 30° North Latitude, and are approximately correct north and south respectively of the 35th parallel.

These latitudes may be taken to correspond to the following States and Territories:—

40° North Latitude.—Ariz. (N.), Ark. (N.), Cal. (N.), Colo., Conn., Del., D.C., N. Dak., S. Dak., Idaho, Ill., Ind., Okla. (N.), Iowa, Kans., Ky., Mass., Me., Md., Mich., Minn., Mo., Mont., Nebr., Nev., N.C., N.H., N. Mex. (N.), N.Y., Ohio, Oreg., Pa., R.I., Tenn., Utah, Va., Vt., Wash., Wis., Wyo., W. Va.

ALSO FOR SOUTHERN EUROPE (THE MEDITERRANEAN), ASIA MINOR, CENTRAL CHINA, JAPAN, KOREA.

30° North Latitude.—Ala., Ariz. (S.), Ark. (S.), Cal. (S.), Fla., Ga., La., Miss., N. Mex. (S.), Okla. (S.), S.C., Tex.

ALSO for MADEIRA, CANARY ISLANDS, NORTH AFRICA, PERSIA, AFGHANISTAN, NORTHERN INDIA, TIBET, S. CHINA.

For other latitudes, multiply the light value for 40° N. by the factor given on page 215.

The latitudes given may be taken to correspond to the following countries:—

60° North Latitude.—ICELAND, FAROE ISLANDS, SHETLAND ISLANDS, SOUTHERN NORWAY, CENTRAL SWEDEN, NORTH RUSSIA, CENTRAL SIBERIA, ALASKA, YUKON (KLONDIKE), NORTH CANADA AND SOUTH GREENLAND.

55° North Latitude.—NORTH BRITAIN, DENMARK, SOUTHERN SWEDEN, CENTRAL RUSSIA, SOUTHERN SIBERIA, CENTRAL CANADA.

52° North Latitude.—ENGLAND, IRELAND, BELGIUM, HOLLAND, GERMANY, SOUTHERN RUSSIA, NORTHERN CHINA, NEWFOUNDLAND AND SOUTHERN CANADA.

SPECIAL NOTE

At the end of each month tear away one page, and the table for the next month will appear facing the Calculator.

TABLE B.—PLATES AND FILMS (contd.)

	Col. I.	Col. II.	Col. III.
Wratten Panchromatic	1/8	1/16	N
Process & M.	1/2	1/4	N
Zeiss Ikon Roll Film & Film Pack	1/8	1/12	B
" " Ultra Fast Roll Film			
and Pack	1/16	1/24	B
" " Pernox	1/24	1/32	B
CINE FILMS			
Agfa 32 mm. Fine Grain	1/12	1/16	B
" " " Isochrome	1/16	1/24	A
" " " Superpan.	1/24	1/32	B
" " " 16 mm. Pan. Negative	1/16	1/24	A
" " " " Reversible Pan.	1/16	1/24	—
" " " " Ortho	1/16	1/24	—
" " " " Novopan.	1/24	1/32	—
Du Pont 35 mm. Reg. Pan. Neg.	1/12	1/16	B
" " " " Special Pan.			
Neg.	1/16	1/24	B
" " " " Superpan. Neg.	1/24	1/32	B
Ensign Ciné Film... ..	1/8	1/12	B
Eastman 35 mm. Superpan.	1/24	1/32	B
" " " Pan.	1/16	1/24	B
" " " Ortho	1/16	1/24	B
" " " 16 mm. Pan. Reversible	1/8	1/12	—
" " " Superpan.	1/24	1/32	—
" " " 8 mm. Pan.	1/8	1/12	—
" " " *Kodacolor	1/8	—	—
Gevaert 35 mm. Fine Grain	1/12	1/16	B
" " " Express	1/16	1/24	B
" " " 16 mm. Fine Grain			
Ortho Neg.	1/12	1/16	B
" " " Pan. Neg.	1/8	1/12	A
" " " Ortho Reversal	1/12	1/16	—
" " " Express	1/16	1/24	B
" " " 9.5 mm. Fine Grain			
Ortho Neg.	1/12	1/16	B
" " " Ortho Reversal	1/12	1/16	—
" " " Superpan.	1/16	1/24	—
Mimosa Fine Grain	1/8	1/12	B
" " " Extrema	1/16	1/24	B
Pathé Ortho Reversible	1/8	1/12	—
" " " Pan.	1/16	1/24	—
Perutz 35 mm. Special Antihal.	1/12	1/16	A
" " " Special	1/16	1/24	A
" " " Persenso	1/24	1/32	B

* The above factor does not include the filter

LIGHT TABLE FOR THE TROPICS

The Light Table given below is suitable for use in the Tropics, *i.e.*, between about 20° N. and 20° S. latitude, all the year round.

LOCAL MEAN TIME	Sun shining un-obscured	Sun obscured by light clouds or slight mist	Dull or misty	Very dull
10 a.m. to 2 p.m.	1/12	1/6	1/3	3/4
9 a.m. and 3 p.m.	1/8	1/4	1/2	1
8 a.m. and 4 p.m.	1/6	1/3	3/4	1-1/2
7 a.m. and 5 p.m.	1/4	1/2	1	1 1/2

† These figures must be used with caution. They may safely be doubled from October to February between 10° and 20° North, and from April to August between 10° and 20° South. Unless orthochromatic plates are employed, they must certainly be increased from 5 to 10 times when the light is yellow or inclined to red.

The countries for which the above Light Table is suitable, include INDIA, CEYLON, BURMA, SIAM, COCHIN CHINA, CAMBODIA, MALAY PENINSULA, SUMATRA, JAVA, BORNEO and the STRAITS SETTLEMENTS, the PHILIPPINES, FIJI ISLANDS, NORTH AUSTRALIA, POLYNESIA and the HAWAIIAN ISLANDS.

CENTRAL AMERICA, WEST INDIES, VENEZUELA, COLOMBIA, GUIANA, ECUADOR, BRAZIL, PERU and BOLIVIA.

CENTRAL AFRICA, including the Sudan and all portions of the Continent *south* of Egypt and *north* of the Transvaal.

SOUTHERN ARABIA, ZANZIBAR and MADAGASCAR.

Special Announcement

EXPERT ADVICE — FREE

Burroughs Wellcome & Co. have always given special attention to queries connected with the use of their photographic products.

The wide experience of their photographic experts and chemists is placed at the disposal of all purchasers of the 'Wellcome' Photographic Calculator, Handbook and Diary in the fullest possible way. Advice will be given on technical photographic matters, so long as it does not involve criticism of the products of other manufacturers, without any charge whatsoever.

Enquirers must register themselves as purchasers of the 'Wellcome' Photographic Calculator, Handbook and Diary *each year* by filling in and posting the form which will be found on *page* 235, at the back of the January Light Table.

Readers who register their names in this way will also have the advantage of receiving interesting photographic literature published by the firm from time to time.

DECEMBER LIGHT TABLES

Latitude 40° N.

LOCAL MEAN TIME	Sun shining un-obscured	Sun obscured by light clouds or slight mist	Dull or misty	Very dull
11 a.m. to 1 p.m.	1/4	1/2	1	2
10 a.m. and 2 p.m.	1/3	3/4	1-1/2	2
9 a.m. and 3 p.m.	†3/4	†1-1/2	†3	†6

Latitude 30° N.

LOCAL MEAN TIME	Sun shining un-obscured	Sun obscured by light clouds or slight mist	Dull or misty	Very dull
10 a.m. to 2 p.m.	1/6	1/3	3/4	1-1/2
9 a.m. and 3 p.m.	1/4	1/2	1	2
8 a.m. and 4 p.m.	1/2	1	2	4
7 a.m. and 5 p.m.	†1-1/2	†3	—	—

† These figures must be used with caution. Unless orthochromatic plates are employed they must certainly be increased from 5 to 10 times when the light is yellow or inclined to red.

EXPOSURE

LIGHT FACTORS FOR VARIOUS DEGREES OF LATITUDE

EXAMPLES.—The light value given in Monthly Tables (40° N.) for January, 11 a.m., Bright Sunlight, is 1/4.
In the Yukon, under the same conditions, it will be 1/4 × 3 = 3/4.

North Latitude	Dec.	Jan. Nov.	Oct. Feb.	Sept. March	Aug. April	May, June July
60°	4	3	2	1-1/4	1	1
55°	3	2	2	1	1	1
52°	2	2	1-1/2	1	1	1

For the Tropics, *i.e.*, between 20° N. and 20° S., see page 212
A separate edition of this book is published, giving Light Tables for all countries in the Southern Hemisphere and Tropics

NOVEMBER LIGHT TABLES

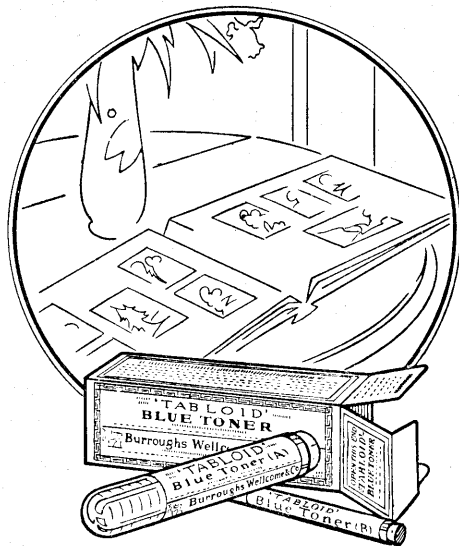
Latitude 40° N.

LOCAL MEAN TIME	Sun shining un-obscured	Sun obscured by light clouds or slight mist	Dull or misty	Very dull
11 a.m. to 1 p.m.	1/4	1/2	1	2
10 a.m. and 2 p.m.	1/3	3/4	1-1/2	3
9 a.m. and 3 p.m.	†3/4	†1-1/2	†3	—

Latitude 30° N.

LOCAL MEAN TIME	Sun shining un-obscured	Sun obscured by light clouds or slight mist	Dull or misty	Very dull
10 a.m. to 2 p.m.	1/6	1/3	3/4	1-1/2
9 a.m. and 3 p.m.	1/4	1/2	1	2
8 a.m. and 4 p.m.	1/3	3/4	1-1/2	3
7 a.m. and 5 p.m.	†1	†2	†4	—

† These figures must be used with caution. Unless orthochromatic plates are employed they must certainly be increased from 5 to 10 times when the light is yellow or inclined to red.



TRADE MARK 'TABLOID' BRAND

TONERS

Provide easy means of
adding colour to prints
or lantern slides

OCTOBER LIGHT TABLES

Latitude 40° N.

LOCAL MEAN TIME	Sun shining un-obscured	Sun obscured by light clouds or slight mist	Dull or misty	Very dull
11 a.m. to 1 p.m.	1/4	1/2	1	2
10 a.m. and 2 p.m.	1/3	3/4	1-1/2	3
9 a.m. and 3 p.m.	1/2	1	2	4
8 a.m. and 4 p.m.	†1	†2	—	—

Latitude 30° N.

LOCAL MEAN TIME	Sun shining un-obscured	Sun obscured by light clouds or slight mist	Dull or misty	Very dull
11 a.m. to 1 p.m.	1/8	1/4	1/2	1
10 a.m. and 2 p.m.	1/6	1/3	3/4	1-1/2
9 a.m. and 3 p.m.	1/4	1/2	1	2
8 a.m. and 4 p.m.	1/3	3/4	1-1/2	3
7 a.m. and 5 p.m.	†3/4	†1-1/2	†3	—

† These figures must be used with caution. Unless orthochromatic plates are employed they must certainly be increased from 5 to 10 times when the light is yellow or inclined to red.

Tear off along this line

ORDER FORM FOR THE 1935 EDITION OF THIS DIARY

By using this Order Form when the Light Table overleaf has served its purpose, you will obtain the 1935 Edition at the earliest possible date.

Fill in your name and address and send to your dealer, enclosing the usual amount for the book, adding postage if necessary.

If you know of a photographer, beginner or otherwise, who has not yet become a subscriber, you would confer a favour upon your dealer and the publishers by supplying his or her name and address in the right-hand portion.

Please send The 'Wellcome' Photo Exposure Calculator,

Handbook and Diary, 1935, as soon as issued.

.....enclosed in payment.

Please send full particulars of The 'Wellcome' Photo Exposure Calculator, Handbook and Diary.

Name

Address

Name

Address

SEPTEMBER LIGHT TABLES

NOTE.—In those countries in which "Summer Time" is adopted it will be necessary to advance the times given below by one hour.

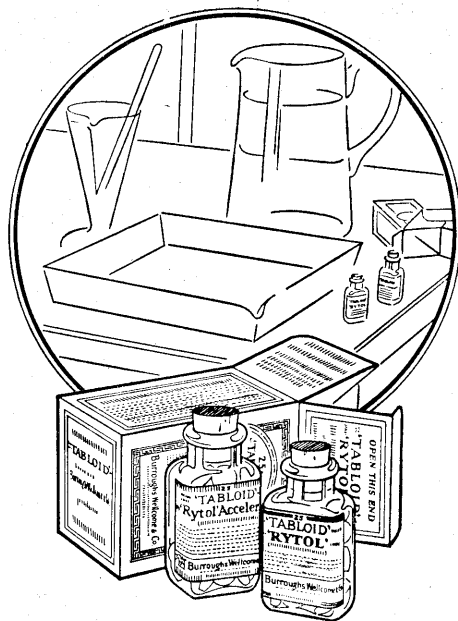
Latitude 40° N.

LOCAL MEAN TIME	Sun shining un-obscured	Sun obscured by light clouds or slight mist	Dull or misty	Very dull
10 a.m. to 2 p.m.	1/6	1/3	3/4	1-1/2
9 a.m. and 3 p.m.	1/4	1/2	1	2
8 a.m. and 4 p.m.	1/2	1	2	4
7 a.m. and 5 p.m.	†1	†2	—	—

Latitude 30° N.

LOCAL MEAN TIME	Sun shining un-obscured	Sun obscured by light clouds or slight mist	Dull or misty	Very dull
10 a.m. to 2 p.m.	1/8	1/4	1/2	1
9 a.m. and 3 p.m.	1/6	1/3	3/4	1-1/2
8 a.m. and 4 p.m.	1/4	1/2	1	2
7 a.m. and 5 p.m.	†1/2	†1	†1-1/2	†2

† These figures must be used with caution. Unless orthochromatic plates are employed they must certainly be increased from 5 to 10 times when the light is yellow or inclined to red.



TRADE MARK 'TABLOID' BRAND

TRADE MARK 'RYTOL' MARK

UNIVERSAL DEVELOPER

Prepared in a moment simply by dissolving accurate, ready-weighted products in water

AUGUST LIGHT TABLES

NOTE.—In those countries in which "Summer Time" is adopted it will be necessary to advance the times given below by one hour.

Latitude 40° N.

LOCAL MEAN TIME	Sun shining un-obscured	Sun obscured by light clouds or slight mist	Dull or misty	Very dull
10 a.m. to 2 p.m.	1/6	1/3	3/4	1-1/2
9 a.m. and 3 p.m.	1/4	1/2	1	2
8 a.m. and 4 p.m.	1/3	3/4	1-1/2	3
7 a.m. and 5 p.m.	†1	†2	†4	—
6 a.m. and 6 p.m.	†1-1/2	†3	—	—

Latitude 30° N.

LOCAL MEAN TIME	Sun shining un-obscured	Sun obscured by light clouds or slight mist	Dull or misty	Very dull
10 a.m. to 2 p.m.	1/12	1/6	1/3	3/4
9 a.m. and 3 p.m.	1/8	1/4	1/2	1
8 a.m. and 4 p.m.	1/6	1/3	3/4	1-1/2
7 a.m. and 5 p.m.	1/3	3/4	1-1/2	3
6 a.m. and 6 p.m.	†1-1/2	†3	—	—

† These figures must be used with caution. Unless orthochromatic plates are employed they must certainly be increased from 5 to 10 times when the light is yellow or inclined to red.



TRADE MARK 'SKETOFAX' BRAND

AROMATIC CREAM

Helps to prevent attacks by mosquitoes, gnats and midges

Soothing if applied after an attack when unprotected

JULY LIGHT TABLES

NOTE.—In those countries in which "Summer Time" is adopted it will be necessary to advance the times given below by one hour.

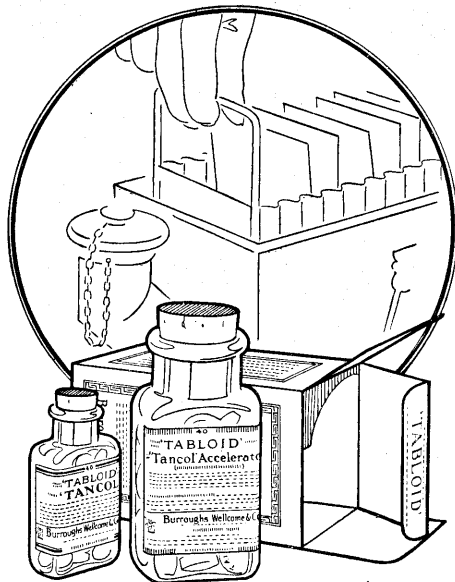
Latitude 40° N.

LOCAL MEAN TIME	Sun shining un-obscured	Sun obscured by light clouds or slight mist	Dull or misty	Very dull
9 a.m. to 3 p.m.	1/8	1/4	1/2	1
8 a.m. and 4 p.m.	1/6	1/3	3/4	1-1/2
7 a.m. and 5 p.m.	1/4	1/2	1	2
6 a.m. and 6 p.m.	†1/3	†3/4	†1-1/2	†3
5 a.m. and 7 p.m.	†1	†1-1/2	†3	—

Latitude 30° N.

LOCAL MEAN TIME	Sun shining un-obscured	Sun obscured by light clouds or slight mist	Dull or misty	Very dull
9 a.m. to 3 p.m.	1/12	1/6	1/3	3/4
8 a.m. and 4 p.m.	1/8	1/4	1/2	1
7 a.m. and 5 p.m.	1/6	1/3	3/4	1-1/2
6 a.m. and 6 p.m.	†1/3	†3/4	†1-1/2	†3

† These figures must be used with caution. Unless orthochromatic plates are employed they must certainly be increased from 5 to 10 times when the light is yellow or inclined to red.



TRADE MARK 'TABLOID' BRAND

TRADE MARK 'TANCOL' MARK

DEVELOPER

Specially prepared for tank use. Gives sparkling negatives of the "pyro" type

JUNE LIGHT TABLES

NOTE.—In those countries in which "Summer Time" is adopted it will be necessary to advance the times given below by one hour.

Latitude 40° N.

LOCAL MEAN TIME	Sun shining un-obscured	Sun obscured by light clouds or slight mist	Dull or misty	Very dull
9 a.m. to 3 p.m.	1/8	1/4	1/2	1
8 a.m. and 4 p.m.	1/6	1/3	3/4	1-1/2
7 a.m. and 5 p.m.	1/4	1/2	1	2
6 a.m. and 6 p.m.	1/3	3/4	1-1/2	3
5 a.m. and 7 p.m.	†3/4	†1-1/2	†3	—

Latitude 30° N.

LOCAL MEAN TIME	Sun shining un-obscured	Sun obscured by light clouds or slight mist	Dull or misty	Very dull
9 a.m. to 3 p.m.	1/12	1/6	1/3	3/4
8 a.m. and 4 p.m.	1/8	1/4	1/2	1
7 a.m. and 5 p.m.	1/6	1/3	3/4	1-1/2
6 a.m. and 6 p.m.	†1/3	†3/4	†1-1/2	†3

† These figures must be used with caution. Unless orthochromatic plates are employed they must certainly be increased from 5 to 10 times when the light is yellow or inclined to red.



TRADE 'HAZELINE' MARK CREAM

The photographer's safeguard
against disfigurement of the
skin by developer or rough-
ness from caustic solutions

MAY LIGHT TABLES

NOTE.—In those countries in which "Summer Time" is adopted it will be necessary to advance the times given below by one hour.

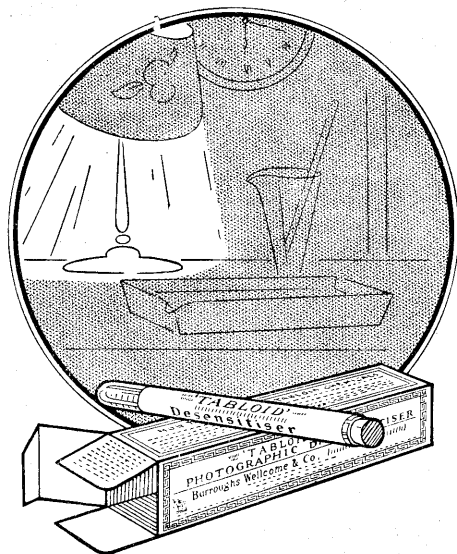
Latitude 40° N.

LOCAL MEAN TIME	Sun shining un-obscured	Sun obscured by light clouds or slight mist	Dull or misty	Very dull
9 a.m. to 3 p.m.	1/6	1/3	3/4	1-1/2
8 a.m. and 4 p.m.	1/4	1/2	1	2
7 a.m. and 5 p.m.	1/3	3/4	1-1/2	3
6 a.m. and 6 p.m.	1/2	1	1 1/2	4
5 a.m. and 7 p.m.	1	1 1/2	—	—

Latitude 30° N.

LOCAL MEAN TIME	Sun shining un-obscured	Sun obscured by light clouds or slight mist	Dull or misty	Very dull
9 a.m. to 3 p.m.	1/12	1/6	1/3	3/4
8 a.m. and 4 p.m.	1/8	1/4	1/2	1
7 a.m. and 5 p.m.	1/4	1/2	1	2
6 a.m. and 6 p.m.	1/3	1-1/2	1 1/2	—

† These figures must be used with caution. Unless orthochromatic plates are employed they must certainly be increased from 5 to 10 times when the light is yellow or inclined to red.



TRADE MARK 'TABLOID' BRAND

DESENSITISER

Makes bright-light development possible

Eliminates the dark-room

APRIL LIGHT TABLES

NOTE.—In those countries in which "Summer Time" is adopted it will be necessary to advance the times given below by one hour.

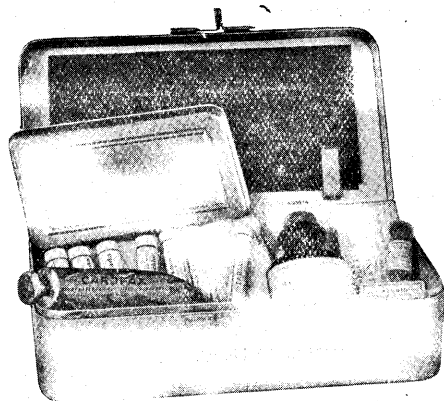
Latitude 40° N.

LOCAL MEAN TIME	Sun shining un-obscured	Sun obscured by light clouds or slight mist	Dull or misty	Very dull
10 a.m. to 2 p.m.	1/6	1/3	3/4	1-1/2
9 a.m. and 2 p.m.	1/4	1/2	1	2
8 a.m. and 4 p.m.	1/3	3/4	1-1/2	3
7 a.m. and 5 p.m.	†3/4	†1-1/2	†3	—
6 a.m. and 6 p.m.	†1-1/2	†3	—	—

Latitude 30° N.

LOCAL MEAN TIME	Sun shining un-obscured	Sun obscured by light clouds or slight mist	Dull or misty	Very dull
9 a.m. to 3 p.m.	1/12	1/6	1/3	3/4
8 a.m. and 4 p.m.	1/8	1/4	1/2	1
7 a.m. and 5 p.m.	1/4	1/2	1	2
6 a.m. and 6 p.m.	†1	†2	†4	—

† These figures must be used with caution. Unless orthochromatic plates are employed they must certainly be increased from 5 to 10 times when the light is yellow or inclined to red.



HOUSTON—MOUNT EVEREST FLIGHT

1933

Members of this Expedition achieved the conquest of Everest by air and brought back a most interesting photographic record of the highest mountain in the world from the air.

The No. 261 'Tabloid' Medicine Case (*illustrated above*) was one of the equipments supplied for the aeroplane. In addition, the Expedition used a No. 244 'Tabloid' Medicine Case for service at the base.

MARCH LIGHT TABLES

Latitude 40° N.

LOCAL MEAN TIME	Sun shining un-obscured	Sun obscured by light clouds or slight mist	Dull or misty	Very dull
10 a.m. to 2 p.m.	1/6	1/3	3/4	1-1 2
9 a.m. and 3 p.m.	1/4	1/2	1	2
8 a.m. and 4 p.m.	1/3	3/4	1-1/2	3
7 a.m. and 5 p.m.	†1	†2	—	—

Latitude 30° N.

LOCAL MEAN TIME	Sun shining un-obscured	Sun obscured by light clouds or slight mist	Dull or misty	Very dull
10 a.m. to 2 p.m.	1/8	1/4	1/2	1
9 a.m. and 3 p.m.	1/6	1/3	3/4	1-1/2
8 a.m. and 4 p.m.	1/4	1/2	1	2
7 a.m. and 5 p.m.	†1/2	†1	†2	†4
6 a.m. and 6 p.m.	†3	—	—	—

† These figures must be used with caution. Unless orthochromatic plates are employed they must certainly be increased from 5 to 10 times when the light is yellow or inclined to red.



TRADE MARK 'TABLOID' BRAND

CHROMIUM INTENSIFIER

Gives printing strength
to weak negatives

Simple and safe to use

FEBRUARY LIGHT TABLES

Latitude 40° N.

LOCAL MEAN TIME	Sun shining un-obscured	Sun obscured by light clouds or <i>slight mist</i>	Dull or misty	Very dull
11 a.m. to 1 p.m.	1/4	1/2	1	2
10 a.m. and 2 p.m.	1/3	3/4	1-1/2	3
9 a.m. and 3 p.m.	1/2	1	2	4
8 a.m. and 4 p.m.	†1	†2	†4	—

Latitude 30° N.

LOCAL MEAN TIME	Sun shining un-obscured	Sun obscured by light clouds or <i>slight mist</i>	Dull or misty	Very dull
11 a.m. to 1 p.m.	1/8	1/4	1/2	1
10 a.m. and 2 p.m.	1/6	1/3	3/4	1-1/2
9 a.m. and 3 p.m.	1/4	1/2	1	2
8 a.m. and 4 p.m.	†1/2	†1	—	—

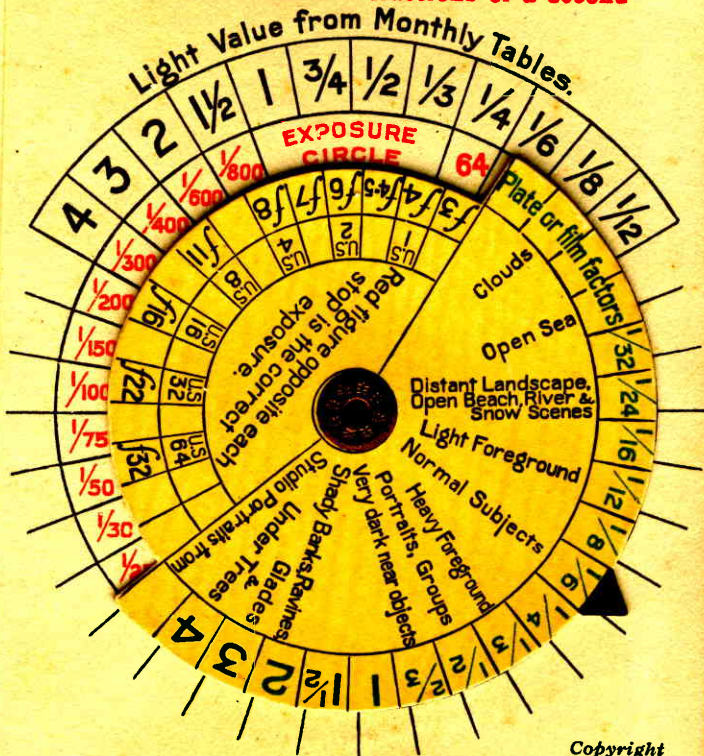
† These figures must be used with caution. Unless orthochromatic plates are employed they must certainly be increased from 5 to 10 times when the light is yellow or inclined to red.

'WELCOME' EXPOSURE CALCULATOR

Turn disc until GREEN FIGURE representing *plate or film factor* (see Table B, page 204) is opposite BLACK FIGURE representing the *Light Value*. (See Tables opposite).

NORMAL SUBJECTS (see page 186)

The **RED FIGURE** opposite each stop gives the correct exposure in **seconds or fractions of a second**



For stops not on Calculator, see page 190

PORTRAITS (in a well-lighted room)

The **RED FIGURE** opposite each stop gives the correct exposure in **minutes or fractions of a minute**

FOR OTHER SUBJECTS (see pages 186-188)

Set Calculator as for normal subjects. Note position of **BLACK POINTER**; turn disc again until your special **SUBJECT** points to the division where pointer previously rested.

Then the correct exposure for your special subject is the **RED FIGURE** opposite each stop

NOTE.—Exposures are seconds or fractions of a second except for subjects marked with an asterisk (see page 202)

SKETOFAX

FOR THE OUTDOOR PHOTOGRAPHER
PROTECTS AGAINST MOSQUITOES, GNATS AND MIDGES
EFFECTIVE AND PLEASANT TO USE
MADE IN U.S.A.

SKETOFAX

B W & C^o

A boon to out-door
photographers. Pro-
tects against mosqui-
toes,gnats and midges

SEE

