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TRADE MARK



DAILY PRODUCTION, 3500 DOZENS.

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Price	$4\frac{1}{2} \times 3\frac{1}{4}$	5×4	$6\frac{1}{2} \times 4\frac{1}{2}$	$7\frac{1}{2} \times 5$	$8\frac{1}{2} \times 6\frac{1}{2}$	10×8	12×10	15×12
Per Dozen.	1/8	2/5	3/6	5/-	6/6	10/7	15/6	25 6

Other Sizes at proportionate Prices. 10 per cent. Discount for Cash with Order.

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The Most Important Recent Improvement in Photography.

EVERY AMATEUR SHOULD TRY

Edwards's "Isochromatic Plates."

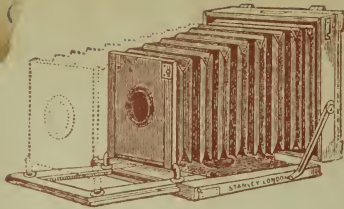
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These Plates are especially suitable for LANDSCAPES, with Foliage, and Natural Clouds.
Portraits at Home, and Instantaneous Views.

Sample Box, One Dozen $\frac{1}{4}$ Plates, 2/6 ; One Dozen $\frac{1}{2}$ Plates, 4/9. Post Free.

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The Highest Class Instruments obtainable ; are made with the dark slides, fronts, and screw nuts fitted to standard gauges, and interchangeable in the various sizes. The Dark Slides are fitted with patented spring catches and stops to their shutters.

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An Illustrated Catalogue of Cameras, Lenses, and everything required in Photography, sent Post Free to any Address on application.



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Opticians to Her Majesty's Government,
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“ *The number of considerations entering into the calculations for exposure is so great that many will not undertake to weigh them against each other, and strike the balance which shall point out the particular exposure to be given in any particular case. These say that they can look at the image on the ground glass, and can judge from its brightness, as it appears to their eyes, what is the exposure required; and that from this one indication they obtain a result which is rarely seriously wrong!* For those who are in such complete enjoyment of this happy faculty of correct judgment, further aids may be unnecessary; but there is the far larger number, even amongst careful and experienced workers, who are somewhat diffident of the accuracy of their judgment, and who recognise that this judgment varies in the same individual with causes, such as state of health, that are not under control. *By these, as well as those who have less experience, what aid science can give, either in the shape of well-ascertained data, or of tables to save the trouble and liability to error of individual calculation for every particular case, will be welcomed.*”—PHOTOGRAPHIC NEWS,

SECOND THOUSAND.

THE PRACTICAL INDEX
OF
PHOTOGRAPHIC EXPOSURE,

WITH AN APPENDIX AS TO
SENSITOMETER NUMBERS AND RAPIDITY OF PLATES.

BY
A. R. WORMALD.

PUBLISHED BY THE AUTHOR, SUTTON, SURREY,
And may be obtained of all Photographic Dealers.


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HARRISON AND SONS
PRINTERS IN ORDINARY TO HER MAJESTY.
ST. MARTIN'S LANE.

THE PRACTICAL INDEX
OF
PHOTOGRAPHIC EXPOSURE.

 HE object of the following Tables is to supply a want that it is believed has hitherto remained unsatisfied—one that every beginner in Photography must experience namely, the want of a ready means of knowing (without calculations, or with as little calculation as possible), the duration of exposure likely to produce a good negative with a given stop and plate.

Notwithstanding that exposure tables have been characterised as a “delusion and a snare” by some who, spite of their many failures and ignorance of the focal

values of stops, think they know more than any Tables can teach them, it is nevertheless a worse "delusion and snare" to have *no guide whatever*; for a beginner to experiment with half-a-dozen various stops, and no indication as to the exposure necessary with any one of them, is like setting out on a journey without having the slightest notion as to the direction in which the intended destination is to be found.

All opinions to the contrary, there can be no doubt whatever that the Tables previously available have been of great service to such as have used them with care and with a desire to make them useful, but a serious objection has been the number of items and calculations needful in arriving at the desired result.

An objector writes:—"Truly the time and trouble expended in their compilation must have been enormous, and the methods of using them are not characterised by sweet simplicity. Ascertain (says he) the intensity ratio of the stop used, multiply by a factor, appraise the character of the subject, and then add, subtract, multiply or divide by a 'subject number,' make a correction for the season of the year and the time of day, and then expose—but alas! the light has changed, the effect is gone."

THE PRACTICAL INDEX TABLES will, in a great measure, dispense with the necessity for such calculations as are here so severely ridiculed, nor will it be necessary to use actinometers, photometers, and the like, in connection therewith. They will be found to indicate in a clear and simple manner, and *at a glance* the duration of exposure for every month of the year, every hour of the day, and every stop generally in use (and for other stops it will be easy to judge the proportional figures).

Success in Photography depends in a great measure on a correct estimate of the exposure necessary when using any given stop. It is the diameter of aperture of the lens or stop in proportion to the focal length of a lens that determines its (so-called) rapidity of action—the fact being that every lens is of *equal* rapidity when used with an equivalent stop—thus a single lens used with *its* stop $\frac{f}{20}$ is identical in rapidity with a portrait lens used with *its* stop $\frac{f}{20}$, and a knowledge of this will prevent much misapprehension in the minds of beginners in Photography who read advertisements of “rapid lenses.” The term “rapid” lens only indicates that it is of *comparative* short focus and wide aperture—it is not a quality of the lens—thus

while a portrait lens of short focus and wide diameter will work at $\frac{F}{2}$, or an aperture of half its focal length, a view-lens of smaller aperture and longer focus may only commence work at $\frac{F}{10}$ (aperture a tenth of its focal length), but the *so-called* quick portrait-lens is no quicker at $\frac{F}{10}$ than is the view-lens at $\frac{F}{10}$.

From this it will be seen that a Table of Exposures adapted to any given lens, is equally adapted to any other lens, the universal applicability of such a Table being governed only by the focal value of the various stops employed, and the rapidity of plate used.

It is perhaps desirable to explain that there are several systems of stops in the market, and two of the series most commonly in use have been adopted in these Tables, namely, the standard system of the Photographic Society of Great Britain with $\frac{F}{4}$ as the unit of aperture (U.S. stop No. 1), and the series generally sent out by French and other makers, with $\frac{F}{10}$ as the unit or No. 1 stop. The latter may be considered as the most convenient for landscape work, they have more workable focal values than the standard system, as in squaring say No. 1 stop, $\frac{F}{10}$, the result is 100, and the successive stops give results 200, 400, &c., in squaring to ascertain

their relative rapidity. The numbers and focal values of *both* systems are clearly shown in the Tables. The Photographer is recommended to steer, in all cases, by the *focal values of the stops*, rather than by their *numbers*, as the focal values are a universal index *common to all systems of stops*, while the stop *numbers* only indicate the relative exposure as between one stop and another *when applied to the particular set of stops in which they are employed*. Thus by a reference to the Tables, it will be seen that the *numbers* in the U.S. column are 1 to 256, while the *numbers* of the other set are 1 to 32. Now the *same numbers* in each set (as No. 16 for example) are *not the same, or equivalent stops*, but if we take a stop from *each* series designated by its focal value $\frac{F}{16}$ such are *identical*, and in *any set* of stops $\frac{F}{16}$ will be *precisely* the same in its effect on the necessary exposure, no matter by what *number* it may be called.

It is presumed the photographer will have the *focal value* of each of his stops marked plainly upon them, if not, he should get his Optician to supply the needful figures at the earliest opportunity, or, he may find them for himself by dividing the focal length of his lens by the diameter of the stop-aperture in each case. The

focal length of the lens may be found by obtaining a sharply focussed image of a distant object (at least 60 feet) on the focussing screen, and then measuring the distance between the ground glass and (1) the glass of a single lens, or (2) the stop-slit of a double lens. The diameter of stop-aperture may be accurately ascertained with a wedge-shaped piece of card pushed into the aperture as far as it will go, and measured where the card is cut, or indented, by the edge of the aperture. Suppose the focal length is found to be 10 inches and the aperture of one of the stops 1 inch, $\frac{F}{10}$ will be its focal value; another stop of the set is found to be $\frac{5}{7}$ of an inch, and 10 divided by $\frac{5}{7}$ gives $\frac{14}{5}$ as its focal value, and so on with the others.

The exposures given in the Index Tables are for sunlight, using 30 times plates, and where these are not present allowances must be made; thus 20 times plates will require an exposure of *half as much again* as the 30 times, while 60 times plates will require only *half* the exposure. If the sun is obscured so that there is good diffused light, the exposure must be doubled, trebled for cloudy weather and quadrupled when very dull.

Too much importance need not be attached to varying exposure to suit different

subjects, and in proof of this it is only necessary to point out that the *golden rule* is to *expose for the darkest shadows*.

Now if the highest lights are not spoiled by exposing for the darkest shadows, in the *same* picture, it follows that both light and dark subjects are *capable* of receiving a *similar* amount of exposure, indeed it will be found that it is *nearness* and *distance* of subjects rather than their kind or quality that require the most consideration. Thus confined and near objects require the most exposure, and open views embracing long distances (distant mountains, sea and sky for example), require the least.

The exposures given in the Index Tables will be found to be of average duration for most outdoor work, but for open landscapes it may be halved, and quartered for distant views without near foreground. Views made up of sea and sky require the shortest of all exposures, and for such a twelfth part of the time in the Tables will (with bright sunshine) be found sufficient.

The photographer using the Index Tables will not have to calculate for season time, lens, or stop; *light* and subject *or distance* being the only considerations that

will add to or diminish the number of seconds given (when using 30 times plates).

For example, suppose we are taking an ordinary view, say in a lane (not heavily overshadowed by trees). We are using 30 times plates and say $\frac{F}{32}$ stop. It is June and 8 o'clock in the morning. A reference to June table gives two seconds in sunlight. And if the sun were under a cloud then four seconds (double exposure), would be necessary.

If we turn to the February Table we shall find that at same hour and with same stop the sunshine exposure would require to be $13\frac{3}{4}$ (say 14) seconds, and the April Table gives us $2\frac{3}{4}$ seconds.

It will not be necessary to multiply examples, the Tables are so simple that the use of them will be clear at a glance.

With reference to the notion that *judgment* is superior to data, one writer gives as a potent reason for his opinion, that the "rapidity of plates varies in different batches, nay even in different plates of the same packet," but he fails to tell us how *judgment* or experience is to gauge this uncertainty any more than Tables can !!

Another writer says he has found that when "the amateur has depended on his own observation," ignoring Tables, "the negatives have always been more satisfactory," in other words that *unaided judgment* or *guess-work* is likely to be superior to *judgment guided by known facts and data*!

To apply the same idea to developers, it ought to be sufficient merely to name the chemicals that should be used, without giving any idea of the proportions in which they should be mixed, letting *judgment* find it out!! It has wisely been said that developers must be "mixed with brains," it is equally true that the use of exposure Tables must be accompanied by common sense, and with this proviso, it is hoped the Practical Tables here supplied will not only be a valuable Index to the beginner, but will prove a useful guide to the photographer of experience and *judgment*.

In the Appendix following the Tables will be found some remarks on sensitizer numbers and rapidity of Plates.





DIRECTIONS AS TO USE OF TABLES.

I. *As to Subject and Distance* (30 times Plates : in sunshine) :—

- | | | |
|---|-----|---------------------------------------|
| 1. Near View with foliage, or dark objects
or shadows in foreground : portraits
and living objects out of doors ... | } | Exposure as in Tables. |
| 2. Near view with long distance ... | ... | Half do. |
| 3. Distant view (no near foreground) ... | ... | Quarter do. |
| 4. Sea and sky | ... | One-twelfth do. |
| 5. Copying | ... | At least Half as much <i>more</i> do. |
| 6. Interiors | ... | 25 times as much (or more) |

II. *As to Light* :—

- | | | |
|----------------------------------|-----|-------------------|
| 1. Sun obscured (bright sky) ... | ... | Double the above. |
|----------------------------------|-----|-------------------|

- | | | | | | |
|------------------|-----|-----|-----|-----|-------------------|
| 2. Cloudy ... | ... | ... | ... | ... | Treble the above. |
| 3. Very dull ... | ... | ... | ... | ... | Four times do. |
| 4. Gloomy ... | ... | ... | ... | ... | Five do. |

III. *As to Plates* (See Appendix) :—

- | | | | | | |
|-------------------------|-----|-----|-----|-----|---|
| 1. Ten times Plates ... | ... | ... | ... | ... | Three times as much as 30 times. |
| 2. Fifteen do. ... | ... | ... | ... | ... | Twice as much as 30 times. |
| 3. Twenty do. ... | ... | ... | ... | ... | Half as much more as 30 times. |
| 4. Forty do. ... | ... | ... | ... | ... | One fourth less than ” |
| 5. Fifty do.... | ... | ... | ... | ... | One-third ” ” |
| 6. Sixty do. ... | ... | ... | ... | ... | Half the 30 times exposure. |

Note.—The zig-zag line in the Tables is merely for convenience ; it divides exposures of one second upwards shown in the lower portion, from exposures of less than one second given in the upper part of the Tables ; when using 30 times plates the lower section can be worked with the cap, while the upper would in sunlight require the use of a shutter.

$\frac{1}{4}$ min $\frac{1}{4}$ hr

12

24

48

96

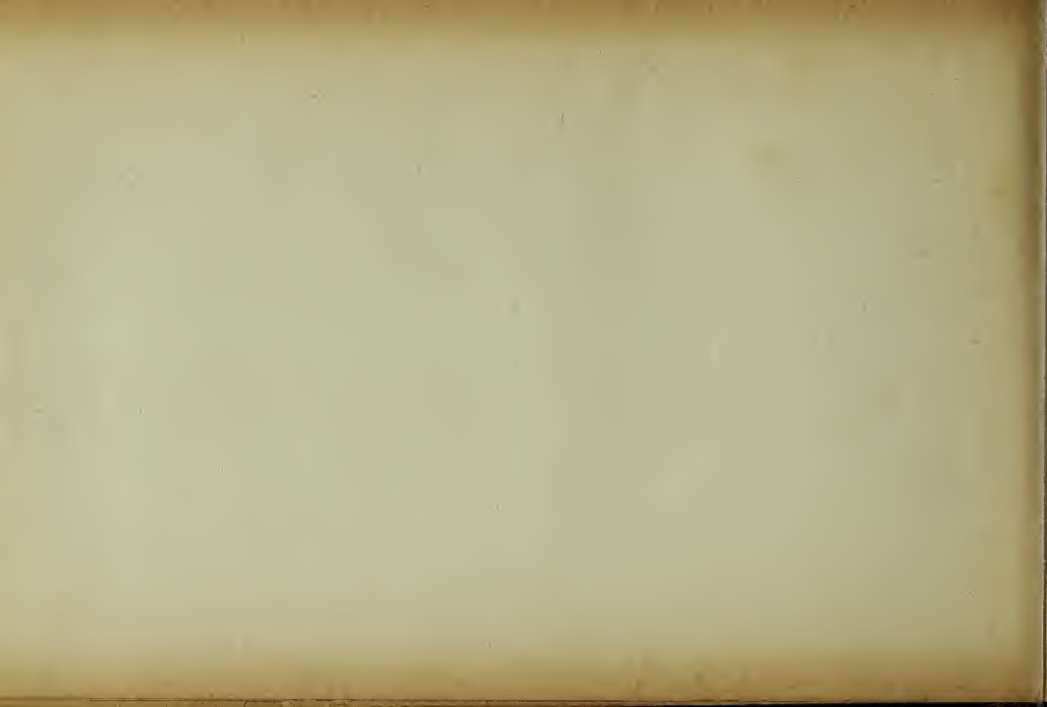
1	$\frac{1}{2}$	$\frac{1}{4}$	2007
2	$\frac{3}{4}$	$\frac{1}{2}$	2008
3	$\frac{7}{8}$	$\frac{3}{4}$	2009

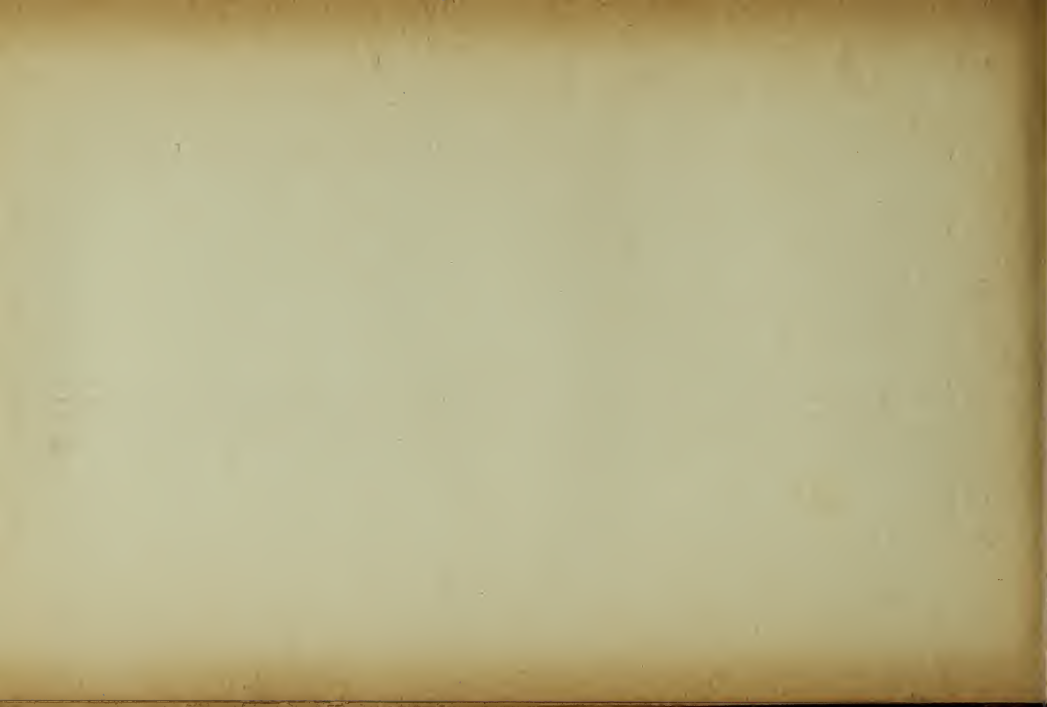
total length
 from
 return before
 first order

January and November.

Stops.		Sun shining 30 Times Plates, Average exposure in Seconds at				
U.S. Nos.	Nos. Unit $\frac{1}{10}$	Relative rapidity.	Ratio or Focal Value.			
Unit $\frac{1}{4}$	Unit $\frac{1}{10}$		Morning.	After noon		
			IX X	II	XI XII	
1	...	16	$\frac{1}{4}$	$\frac{1}{8}$	$\frac{1}{16}$	$\frac{1}{32}$
2	...	32	$\frac{1}{2}$	$\frac{1}{4}$	$\frac{1}{8}$	$\frac{1}{16}$
4	...	64	1	$\frac{1}{2}$	$\frac{1}{4}$	$\frac{1}{8}$
...	1	100	$1\frac{1}{8}$	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{1}{4}$
8	...	128	2	1	$\frac{3}{4}$	$\frac{1}{2}$
...	2	200	$3\frac{1}{4}$	$1\frac{1}{8}$	1	1
16	...	256	$4\frac{3}{8}$	$1\frac{1}{4}$	$1\frac{1}{8}$	$1\frac{1}{8}$
...	4	400	$6\frac{1}{2}$	$2\frac{1}{4}$	$2\frac{1}{8}$	$1\frac{1}{2}$
32	...	512	$8\frac{1}{4}$	$3\frac{1}{2}$	$2\frac{1}{4}$	$2\frac{3}{8}$
...	8	800	13	$5\frac{1}{2}$	$4\frac{1}{4}$	$3\frac{1}{4}$
64	...	1024	$16\frac{1}{2}$	7	$5\frac{1}{2}$	$4\frac{3}{4}$
...	16	1600	26	11	$8\frac{1}{2}$	$7\frac{1}{2}$
128	...	2048	33	14	11	$9\frac{1}{2}$
...	32	3200	51	22	17	15
256	...	4096	66	28	22	19

full X
1/10 1 X
1/20 1 X
1/30 1 X





March and September.

Stops.				Sun shining 30 Times Plates. Average Exposure in Seconds at			
U.S. Nos. Unit $\frac{1}{4}$ F	Nos. Unit $\frac{1}{10}$ F	Relative rapidity.	Ratio or Focal Value.	Morning. VII VIII	IX X	Mid day. XI XII	
				Afternoon. V IV	III II	I XII	
1	...	16	$F \frac{1}{4}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{24}$	$\frac{1}{30}$
2	...	32	$F \frac{2}{5}$	$\frac{1}{8}$	$\frac{1}{10}$	$\frac{1}{12}$	$\frac{1}{16}$
4	...	64	$F \frac{1}{8}$	$\frac{1}{4}$	$\frac{1}{8}$	$\frac{1}{16}$	$\frac{1}{8}$
...	1	100	F 10	$\frac{3}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{3}$
8	...	128	$F \frac{11}{10}$	1	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{4}$
...	2	200	F 14	$1\frac{1}{8}$	$\frac{3}{8}$	$\frac{4}{8}$	$\frac{2}{3}$
16	...	256	$F \frac{16}{5}$	$2\frac{1}{8}$	$\frac{1}{2}$	$\frac{3}{8}$	$\frac{2}{3}$
...	4	400	F 20	$3\frac{1}{4}$	1	$\frac{4}{8}$	$\frac{1}{2}$
32	...	512	$F \frac{22}{5}$	$1\frac{1}{2}$	$1\frac{1}{8}$	$1\frac{1}{8}$	1
...	8	800	F 28	$4\frac{1}{4}$	$2\frac{1}{8}$	2	$1\frac{1}{8}$
64	...	1024	$F \frac{32}{5}$	$6\frac{1}{2}$	$2\frac{1}{4}$	$2\frac{1}{2}$	2
...	16	1600	F 40	$8\frac{1}{2}$	$4\frac{1}{4}$	4	$3\frac{1}{4}$
128	...	2048	$F \frac{45}{4}$	13	$6\frac{1}{2}$	$5\frac{1}{2}$	4
...	32	3200	F 57	17	$8\frac{1}{2}$	$8\frac{1}{2}$	$6\frac{3}{4}$
256	...	4096	$F \frac{64}{5}$	26	13	11	8
				34	17	$9\frac{1}{2}$	



April and August.

Stops.		Sun shining 30 Times Plates. Average exposure in Seconds at			
U.S. Nos.	Nos. Unit $\frac{F}{10}$	Relative rapidity.	Ratio or Focal Value.		
Unit $\frac{4}{F}$			Mo min g. VI VII VIII	Mid day. IX X XI XII	
			Evenin g. V IV	Aft-erno on. III II I	
1	...	16	$\frac{1}{16}$	$\frac{1}{32}$	$\frac{1}{36}$
2	...	32	$\frac{1}{8}$	$\frac{1}{16}$	$\frac{1}{18}$
4	...	64	$\frac{1}{4}$	$\frac{1}{8}$	$\frac{1}{9}$
...	1	100	$\frac{2}{5}$	$\frac{1}{4}$	$\frac{1}{10}$
8	...	128	1	$\frac{1}{2}$	$\frac{1}{8}$
...	2	200	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{1}{10}$
16	...	256	1	$\frac{1}{2}$	$\frac{1}{10}$
...	4	400	$\frac{1}{16}$	$\frac{1}{8}$	$\frac{1}{10}$
32	...	512	$\frac{1}{4}$	1	$\frac{1}{7}$
...	8	800	$\frac{1}{8}$	$\frac{1}{2}$	$\frac{1}{7}$
64	..	1024	$\frac{1}{4}$	2	$\frac{1}{7}$
...	16	1600	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{2}{8}$
128	...	2048	$\frac{1}{2}$	4	$\frac{3}{8}$
...	32	3200	13	$\frac{1}{2}$	$\frac{5}{8}$
256	...	4096	17	8	7



May and July.

Stops.		Sun shining 30 Times Plates. Average Exposure in Seconds at							
U.S. Nos. Unit + F	Nos. Unit F	Relative rapidity.		Ratio or Focal Value.		Mi d-day.			
		V	VI	VII	VIII	IX	X	XI	XII
		Evenin g. VII	VI	V	Evenin g. IV	III	II	I	XII
1	...	$\frac{1}{8}$	$\frac{1}{16}$	$\frac{1}{16}$	$\frac{1}{32}$	$\frac{1}{30}$		$\frac{1}{16}$	
2	...	$\frac{1}{4}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{16}$	$\frac{1}{18}$		$\frac{1}{20}$	
4	...	$\frac{1}{2}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{8}$	$\frac{1}{9}$		$\frac{1}{10}$	
...	1	$\frac{3}{4}$	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{3}{16}$	$\frac{1}{6}$		$\frac{1}{8}$	
8	...	1	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{4}$	$\frac{1}{5}$		$\frac{1}{6}$	
...	2	$1\frac{1}{8}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{8}$	$\frac{1}{3}$		$\frac{1}{4}$	
16	...	$2\frac{1}{8}$	1	$\frac{7}{8}$	$\frac{1}{2}$	$\frac{2}{9}$		$\frac{2}{10}$	
...	4	$3\frac{1}{4}$	$1\frac{1}{8}$	$1\frac{1}{8}$	$\frac{3}{4}$	$\frac{2}{8}$		$\frac{1}{2}$	
32	...	$4\frac{1}{4}$	$2\frac{1}{8}$	$1\frac{3}{4}$	1	$\frac{7}{8}$		$\frac{2}{4}$	
...	8	$6\frac{1}{2}$	$3\frac{1}{4}$	$2\frac{3}{4}$	$1\frac{1}{2}$	$1\frac{1}{4}$		1	
64	...	$8\frac{1}{2}$	$4\frac{1}{4}$	$3\frac{1}{2}$	2	$1\frac{1}{4}$		$1\frac{1}{2}$	
...	16	13	$6\frac{1}{2}$	$5\frac{1}{2}$	$3\frac{1}{4}$	$2\frac{3}{4}$		$2\frac{3}{8}$	
128	...	17	$8\frac{1}{2}$	7	4	$3\frac{1}{2}$		3	
...	32	26	13	11	$6\frac{3}{8}$	$5\frac{1}{2}$		$4\frac{1}{4}$	
256	...	34	17	14	8	7		6	



June.

Sun shining
30 Times Plates.
Average Exposure
in Seconds
at

Stops.		Sun shining 30 Times Plates. Average Exposure in Seconds at															
U.S. Nos. Unit $\frac{1}{F}$	Nos. Unit $\frac{1}{F}$	Ratio or Focal Value.															
		Relative rapidity.															
1	...	$\frac{F}{4}$	$\frac{F}{5\frac{2}{3}}$	$\frac{F}{8}$	$\frac{F}{10}$	$\frac{F}{11\frac{1}{3}}$	$\frac{F}{14}$	$\frac{F}{16}$	$\frac{F}{20}$	$\frac{F}{22\frac{2}{3}}$	$\frac{F}{28}$	$\frac{F}{32}$	$\frac{F}{40}$	$\frac{F}{45\frac{1}{4}}$	$\frac{F}{57}$	$\frac{F}{64}$	
2	...	$\frac{1}{4}$	$\frac{1}{5}$	1	$1\frac{1}{8}$	2	$2\frac{1}{4}$	$3\frac{1}{4}$	$4\frac{1}{2}$	$6\frac{1}{2}$	$8\frac{1}{2}$	13	$16\frac{1}{2}$	26	33	51	66
4	...	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{1}{2}$	$\frac{3}{8}$	1	$1\frac{1}{2}$	$2\frac{1}{2}$	$3\frac{1}{2}$	$4\frac{1}{2}$	$6\frac{1}{2}$	$8\frac{1}{2}$	$10\frac{1}{2}$	14	21	28	33
...	1	$\frac{1}{16}$	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{1}{3}$	$\frac{1}{2}$	$\frac{2}{3}$	1	$1\frac{1}{3}$	$1\frac{1}{2}$	$2\frac{1}{3}$	$3\frac{1}{2}$	$5\frac{1}{4}$	7	$10\frac{1}{2}$	14	21
8	...	$\frac{1}{16}$	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{1}{3}$	$\frac{1}{2}$	$\frac{2}{3}$	1	$1\frac{1}{3}$	$1\frac{1}{2}$	$2\frac{1}{3}$	$3\frac{1}{2}$	$5\frac{1}{4}$	7	$10\frac{1}{2}$	14	21
...	2	$\frac{1}{20}$	$\frac{1}{10}$	$\frac{1}{5}$	$\frac{1}{4}$	$\frac{1}{3}$	$\frac{1}{2}$	1	$1\frac{1}{3}$	$1\frac{1}{2}$	$2\frac{1}{3}$	$3\frac{1}{2}$	$5\frac{1}{4}$	7	$10\frac{1}{2}$	14	21
16	...	$\frac{1}{16}$	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{1}{3}$	$\frac{1}{2}$	$\frac{2}{3}$	1	$1\frac{1}{3}$	$1\frac{1}{2}$	$2\frac{1}{3}$	$3\frac{1}{2}$	$5\frac{1}{4}$	7	$10\frac{1}{2}$	14	21
...	4	$\frac{1}{32}$	$\frac{1}{16}$	$\frac{1}{8}$	$\frac{1}{6}$	$\frac{1}{4}$	$\frac{1}{3}$	$\frac{1}{2}$	$\frac{2}{3}$	1	$1\frac{1}{3}$	$1\frac{1}{2}$	$2\frac{1}{3}$	$3\frac{1}{2}$	$5\frac{1}{4}$	7	$10\frac{1}{2}$
32	...	$\frac{1}{32}$	$\frac{1}{16}$	$\frac{1}{8}$	$\frac{1}{6}$	$\frac{1}{4}$	$\frac{1}{3}$	$\frac{1}{2}$	$\frac{2}{3}$	1	$1\frac{1}{3}$	$1\frac{1}{2}$	$2\frac{1}{3}$	$3\frac{1}{2}$	$5\frac{1}{4}$	7	$10\frac{1}{2}$
...	8	$\frac{1}{64}$	$\frac{1}{32}$	$\frac{1}{16}$	$\frac{1}{12}$	$\frac{1}{8}$	$\frac{1}{6}$	$\frac{1}{4}$	$\frac{1}{3}$	$\frac{1}{2}$	$\frac{2}{3}$	1	$1\frac{1}{3}$	$1\frac{1}{2}$	$2\frac{1}{3}$	$3\frac{1}{2}$	$5\frac{1}{4}$
64	...	$\frac{1}{64}$	$\frac{1}{32}$	$\frac{1}{16}$	$\frac{1}{12}$	$\frac{1}{8}$	$\frac{1}{6}$	$\frac{1}{4}$	$\frac{1}{3}$	$\frac{1}{2}$	$\frac{2}{3}$	1	$1\frac{1}{3}$	$1\frac{1}{2}$	$2\frac{1}{3}$	$3\frac{1}{2}$	$5\frac{1}{4}$
...	16	$\frac{1}{128}$	$\frac{1}{64}$	$\frac{1}{32}$	$\frac{1}{24}$	$\frac{1}{16}$	$\frac{1}{12}$	$\frac{1}{8}$	$\frac{1}{6}$	$\frac{1}{4}$	$\frac{1}{3}$	$\frac{1}{2}$	$\frac{2}{3}$	1	$1\frac{1}{3}$	$1\frac{1}{2}$	$2\frac{1}{3}$
128	...	$\frac{1}{128}$	$\frac{1}{64}$	$\frac{1}{32}$	$\frac{1}{24}$	$\frac{1}{16}$	$\frac{1}{12}$	$\frac{1}{8}$	$\frac{1}{6}$	$\frac{1}{4}$	$\frac{1}{3}$	$\frac{1}{2}$	$\frac{2}{3}$	1	$1\frac{1}{3}$	$1\frac{1}{2}$	$2\frac{1}{3}$
...	32	$\frac{1}{256}$	$\frac{1}{128}$	$\frac{1}{64}$	$\frac{1}{48}$	$\frac{1}{32}$	$\frac{1}{24}$	$\frac{1}{16}$	$\frac{1}{12}$	$\frac{1}{8}$	$\frac{1}{6}$	$\frac{1}{4}$	$\frac{1}{3}$	$\frac{1}{2}$	$\frac{2}{3}$	1	$1\frac{1}{3}$
256	...	$\frac{1}{256}$	$\frac{1}{128}$	$\frac{1}{64}$	$\frac{1}{48}$	$\frac{1}{32}$	$\frac{1}{24}$	$\frac{1}{16}$	$\frac{1}{12}$	$\frac{1}{8}$	$\frac{1}{6}$	$\frac{1}{4}$	$\frac{1}{3}$	$\frac{1}{2}$	$\frac{2}{3}$	1	$1\frac{1}{3}$



December.

Stops.		Sun Shining 30 Times Plates. Average Exposure in Seconds at				
U.S. Nos. Unit $\frac{4}{F}$	Nos. Unit $\frac{10}{F}$	Relative rapidity.		Ratio or Focal Value.	Morning. IX X XI XII	Afternoon. III II I XII
1	...	16	$F \frac{4}{4}$	$\frac{1}{3}$	$\frac{1}{8}$	$\frac{1}{12}$
2	...	32	$F \frac{5\frac{1}{2}}{5\frac{1}{2}}$	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{1}{6}$
4	...	64	$F \frac{8}{8}$	$1\frac{1}{3}$	$\frac{1}{2}$	$\frac{1}{3}$
...	1	100	F 10	$2\frac{1}{8}$	$\frac{1}{4}$	$\frac{1}{2}$
8	...	128	$F \frac{11\frac{1}{3}}{11\frac{1}{3}}$	$2\frac{1}{4}$	1	$\frac{2}{3}$
...	2	200	F 14	$4\frac{1}{4}$	$1\frac{1}{3}$	$1\frac{1}{3}$
16	...	256	$F \frac{16}{16}$	$5\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$
...	4	400	F 20	$8\frac{1}{2}$	$2\frac{1}{4}$	$2\frac{1}{4}$
32	...	512	$F \frac{22\frac{2}{3}}{22\frac{2}{3}}$	11	$3\frac{1}{4}$	$2\frac{1}{2}$
...	8	800	F 28	17	$4\frac{1}{4}$	$2\frac{3}{4}$
64	...	1024	$F \frac{32}{32}$	22	$6\frac{1}{2}$	$4\frac{1}{2}$
...	16	1600	F 40	34	$8\frac{1}{2}$	$5\frac{1}{2}$
128	...	2048	$F \frac{45\frac{1}{2}}{45\frac{1}{2}}$	44	13	9
...	32	3200	F 57	68	17	11
256	...	4096	$F \frac{64}{64}$	88	26	17
					33	22
					28	22

* * * The Sensitomer hitherto in general use, and referred to in these pages, is that known as Warnerke's. Since they were in type MR. W. F. DONKIN, at the Conference of the Camera Club, read a Paper on "A new form of Sensitometer," which he described as being on the principle of the pin-hole camera, the source of illumination being a lighted candle. In the discussion that followed, the Chairman, CAPTAIN ABNEY, referred to a similar invention by MR. SPURGE, in which "the source of illumination was a surface instead of a candle." He "thought there was no instrument so unreliable as Warnerke's Sensitometer, as the divisions never agreed in two specimens, and therefore he hailed the advent of any new form. He had used the Spurge Sensitometer very frequently and with the greatest success."

March, 1888,



APPENDIX ON SENSITOMETER NUMBERS AND THE RAPIDITY OF PLATES.

IN the Table to be found at the end of these remarks, an attempt has been made to assist the photographer with a list of the various negative plates in the market, giving the rapidities and sensitometer numbers, as quoted by their respective makers.

It has, however, been found impossible to make the list as complete as was desired, nor can the author in any sense guarantee or endorse the information it contains ; it must *not* be considered a *comparative* statement of the speeds of the various plates, but merely a record of the maker's own estimate, in each case, and the photographer can confirm or check the figures given, by comparing his own experience of the plate of his choice with the statements made on its behalf. It is

only fair to point out, that the means at the disposal of the makers to reliably estimate and express the rapidity of a plate are far from satisfactory.

Unfortunately, there is no authoritative and universal standard by which to measure the actual, or perhaps even the relative rapidity of, gelatine plates.

The method of indication by comparison with a wet plate is probably the best in theory that could be desired; expressed in terms of so many times (20, 30, 60 times, &c.) the actual as well as comparative speed, would seem to be capable of being clearly represented, but the speed of a wet plate itself depends on items that have no fixed or recognised standard, viz. : the collodion to be used, the bath, and the developer, and until there is an authoritative basis of estimate it will perhaps be impossible to obtain positively reliable information expressed in terms of unequivocal meaning. The sensitometer is another means of indication; but even if the instrument could in all cases be depended upon, it is still necessary (as now used), in order to understand its meaning, to have a scale of ratios (such as "number of times") in conjunction with it, inasmuch as sensitometer numbers bear no sort of ratio to each other that will indicate relative rapidity.

This will be plain from the following scale, translating the sensitometer numbers into the ratio-figures they are usually taken to indicate. Without such a scale sensitometer numbers can only be a mystery to the uninitiated, to whom, it is feared, they supply less practical information than the description of rapidity by "number of times." Thus :

Sensitometer No. 14 may indicate 3 times rapidity of wet plate.

"	15	"	"	4	"	"	"
"	16	"	"	5	"	"	"
"	17	"	"	7	"	"	"
"	18	"	"	9	"	"	"
"	19	"	"	12	"	"	"
"	20	"	"	15	"	"	"
"	21	"	"	20	"	"	"
"	22	"	"	26	"	"	"
"	23	"	"	34	"	"	"
"	24	"	"	45	"	"	"
"	25	"	"	60	"	"	"

In using the Practical Index (or any other guide on Exposure) the above considerations must be borne in mind, and as far as possible care must be taken that the plate in use with the tables is of the "number of times" it is represented to be. This may to some extent be gauged by ascertaining the sensitometer number of the plate in use, and comparing it with the "number of times" in the above scale; or it may be estimated by comparison with the quickest plates in the market, that are admitted to be of "60 times" rapidity. Finally, the Tables themselves will form a test of rapidity: thus, a 30 times plate may be proved to be so by its being found to work satisfactorily with the Index Tables, and similarly any other rapidity may be approximately tested.

The Author is indebted to Mr. Warnerke for a letter kindly confirming the ratios of the above-quoted sensitometer indications, as well as to the many firms who have been good enough to contribute the details in the following Table:—

Maker or Vendor.	Name of Plate.	Description.	Rapidity as quoted.	
			No. of times.	Sensr. No.
American Brand Co. ...	American Brand ...	Ordinary	40	18
"	"	Instantaneous	60	24
American Camera Co. ...	Edgware	Ordinary	30	16
"	"	Extra Rapid	60	19
Britannia Works Co. ...	Ilford	Ordinary	30	18-19
"	"	New Rapid	40	19-20
"	"	Special Rapid	60	23-25
Cadett	Cadett	Very Rapid	—	20
"	"	Lightning	—	25
Chapman	Manchester	Slow	} No information.	
"	"	Rapid		
"	"	Extra Rapid		
Dale	Ludgate	—	No information.	
Derby Plate Co.	Abney	Bromo-Iodide	60	23-25
"	Derby	Rapid	20	20
"	"	Extra Rapid	40	22-24
Eastman Co.	Neg. Paper	—	No information.	
Eastman Co.	Stripping Films	—	No information.	
Edwards & Co.	XL	Extra Sensitive ..	30	15-16

Maker or Vendor.	Name of Plate.	Description.	Rapidity as quoted.	
			No. of times.	Sensr. No.
Edwards & Co.	XL	Special Instantaneous	50	20-22
„	XL	Isochromatic	50-100	—
Elliott	Advance	Extra Special		20
„	Albert	—		
„	Clarke's No. 48 ..	—		No information.
„	Dragon	Ordinary Studio		
„	„	Extra Rapid		
Elliot & Fry	„	Studio		No information.
England	England's	Slow Landscape ...	4	15
„	„	Rapid „	15	20
„	„	Ordinary Studio ...	15	20
„	„	Extra Rapid Studio...	60	25
Fallowfield	Miall	Ordinary		
„	„	Extra Rapid		
„	Tailfer	Isochromatic		No information.
Freeman	Freeman	Rapid		No information.
„	Freeman	Process		No information.
Fry & Co.	Kingston	Landscape	6	12-15
„	„	Special	30	20-22

Maker or Vendor.	Name of Plate.	Description.	Rapidity as quoted.	
			No. of times.	Sensr. No.
Fry & Co.	Kingston	60 times	60	25
"	Flexible Films	—	—	15-17
Gotz	Obernetter	Gel. Bromide	—	24 & 20
"	Dr. Vogel's	Azaline	—	20
Hardcastle	Brightonian	Ordinary	20-25	19
"	"	Extra Rapid	60	24
Hinton	Hinton's	Ground Glass	15	20
Horne & Thornthwaite	Trafalgar	Landscape	4	15
"	"	Instantaneous	12½	20
Houghton & Son	Diamond	—	} No information.	
"	Imperial	—		
Lancaster & Son	Lancaster	Ordinary	10	—
"	"	Extra Rapid	30	—
Leather, Sadler, & Holmes	Alliance	Landscape Special	—	10
"	"	30 times	30	15
"	"	60 times	60	22
Levi & Co.	Leviathan	Rapid	60	15
Marion	Academy	Landscape	} No information.	
"	Britannia	Ordinary		

Maker or Vendor.	Name of Plate.	Description.	Rapidity as quoted.	
			No. of times.	Sensr. No.
Marion	Britannia	Extra Rapid ...	} No information.	22
"	Globe	—		
"	Isochromatic	—		
"	Jerome	—		
"	Soho	Medium Rapid...		
"	"	Extra Rapid ...	} 60	—
Mawson & Swan	Mawson	Instantaneous ...		
"	Castle	—		
"	Photo-Mechanical ...	—		
Mayfield, Cobb & Co. ...	Woolwich	Ordinary	20	—
"	"	Extra Rapid	40	—
"	Special Favorite ...	Slow	10	—
"	"	Rapid	20	—
"	"	Extra rapid	50	—
Morgan & Kidd	Richmond... ..	Ultra Rapid	60	24-25
"	"	Special Instantaneous	15	18-20
"	Neg. Paper	Landscape	15	18-20
Mothersill	Beernaert	Extra Rapid	60	25
Negretti & Zambra ...	Monkhoven	—	—	25

Maker or Vendor.	Name of Plate.	Description.	Rapidity as quoted.	
			No. of times.	Sensr. No.
Newton	Newton	Extra Rapid ...	} No information.	
"	"	Lightning		
Paget Prize Co.	XXX... ..	—	} As 30	—
"	XXXXX	—		to 50
Photo. Artists' Assn.	Charterhouse	Special, 30 times ...	30	—
" "	" "	" 60 times ...	60	—
" "	Albion	Extra rapid	50	—
Pollard Graham & Co.	Derwent	—	No information.	
Pumphrey	Pumphrey	Instantaneous	60	25
"	"	Lifting Films	60	25
Robinson... ..	Regent	Rapid	—	19
Rouch	Rouch	Instantaneous	50	21-23
"	"	Extra rapid	30	18-19
"	"	Slow landscape	15	15
Rudowsky	Dr. Schleussner	Extra rapid	} No information.	
"	"	Orthochromatic		
"	"	Stripping Films		
Sands & Hunter	Premier	Ordinary	—	20
"	"	Extra rapid	—	25

Maker or Vendor.	Name of Plate.	Description.	Rapidity as quoted.	
			No. of times.	Sensr. No.
Amy Scott	Scott	—	No information.	
Shew	Eclipse	Instantaneous	60	25
Spicer Bros.	Perfect	Rapid	No information.	
Stereoscopic Co.	Black-band	Landscape Ordy.	30	21
”	”	Special Instantaneous	60	25
Thomas & Co.	Pall Mall	Extra rapid	60	25
”	”	Thickly coated... ..	15	15-18
United Kingdom Co. ..	United Kingdom	—	20	21
Vérel	60 times	Instantaneous	60	20-22
”	Matchless	Extra rapid	60	20-22
”	30 times	—	30	15-17
Vergara Film Co.	Froedman's Film	—	—	17
”	”	—	—	23
Wratten & Wainwright... ..	London	Ordinary	5	15
”	”	Instantaneous	15	19
”	”	Drop shutter, special	60	24

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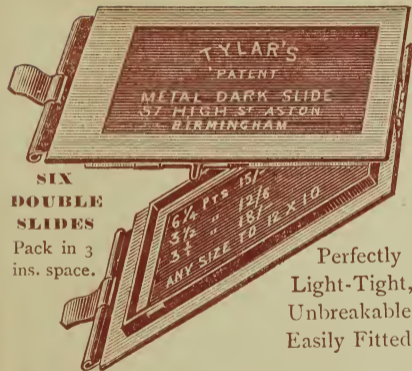
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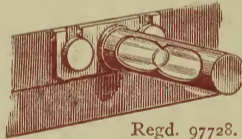
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