

## Wynne's "Infallible" Photographic Exposure Meter

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*The true progress of Invention, is towards simplicity.*

*What the watch is to find the correct time of day, The "Infallible exposure Meter is to find the correct time of exposure.*

*You set the one scale, it does the rest.*

### WYNNE'S "Infallible" Photographic Exposure Meter

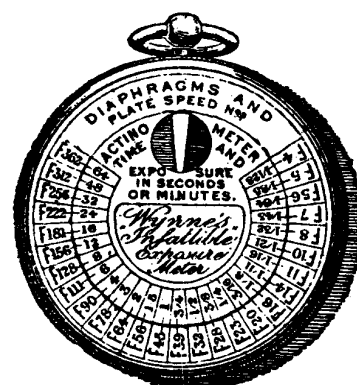
#### IS AN UNERRING GUIDE TO

The correct exposure required for every speed of plate on every kind of subject, and under every condition of light.

The "Infallible" Exposure Meter Company, Wrexham.

THERE is no question that the greatest difficulty a beginner in Photography experiences is in rightly estimating the correct exposure to be given under the varying conditions of Subject, Stop, Speed of a Plate, and Light Value, and without some guide he is generally hopelessly at sea, very often becomes disheartened at the poorness of his results and the large percentage of his failures, and in consequence throws Photography up in disgust. Many ingenious exposure tables have been prepared, which undoubtedly have rendered some aid in estimating the approximately correct exposure, but the calculations involved have been complicated, and the method of obtaining the Light Value, according to the day and hour of the month, the latitude of the place and by the conditions of "Sunshine," "Diffused Light," "Dull," and "Gloomy," gives obviously only a very rough approximation to the true Light Value, and for subjects in a shaded position is of no use whatever. Even when Actinometers have

been used, the process of deducing the correct plate exposure from the time the Actinometer takes to darken, has been troublesome and complicated, each factor having to be calculated for separately. In Wynnes "Infallible" Exposure Meter, by a single movement of a single scale the correct exposure is instantly and simultaneously shown against each stop, from the largest to the smallest.



The four conditions (as before marked) which govern exposure are:

- 1 - The intensity of the light which illuminates the subject.
- 2 - The Diaphragm or Stop employed.
- 3 - The character of the subject to be photographed.
- 4 - The sensitiveness of the plate used.

The first is determined by the time, in seconds, taken for the sensitive paper in the Actinometer to colour to a standard tint. This in the open varies from about 2 or 3 seconds in brilliant summer light to 2 or 3 minutes at sunrise and sunset, and is called the Actinometer Time. In the absence of a Watch having a seconds finger, the Actinometer may

be timed by applying the watch to the ear and counting the number of "ticks " which are usually four or five to the second. If no watch is available a piece of string with a small weight at the end may be used as a pendulum. If the pendulum is 40 inches long it will swing seconds, if 22 inches long  $3/4$  seconds, and if 10 inches long  $1/2$  seconds. There are two tints in the Actinometer, the darker one or standard tint being used for all ordinary subjects and conditions.

The lighter one may be used for interiors, views under trees, or when the light is very weak and takes minutes to colour the paper to the standard tint. To colour to the lighter tint, it takes only one-fourth of the time necessary for the sensitive paper to colour to the darker or standard tint and where the light is very weak its use effects a great saving of time. For directions as to the use of the lighter tint see chapter on interiors. In judging the tint it is better to hold the meter from 18 inches to 2 feet from the eye, instead of close to.

The old Golden Rule of Photography, "to expose for the shadows, and let the high lights take care of themselves," is a good one to observe ; and it therefore follows that the Actinometer should be held so that the light which falls upon it is that which illuminates the darkest portion of the subject in which detail is required to be rendered.

Generally, if the Actinometer is held in the shadow of the body the light value in that position will be the same as if held in the shadow of the subject being photographed. If the painted Tint at anytime requires adjusting, or the scales renewed, new Glass and Dial, with correct standard Tints, and Patent Shutter, can be had.

To expose a fresh surface of sensitive paper turn the Milled Edge of the instrument a distance of about  $1/8$  of an inch to the right or left until a fresh yellow surface of paper is seen through the aperture. Then place the thumb over it until ready to measure the time

it takes to colour to the standard tint as before explained.

When the disc of sensitive paper is being turned to present a new surface for exposure, if the light at the time is very intense, there is danger of the paper being discoloured before it can be covered by the finger.

The New Yellow Glass Exposure Shutter perfectly overcomes this difficulty in the following simple manner:

When a fresh surface is required, the Glass is turned until the Shutter covers the sensitive paper, which can then be turned the requisite distance by observing its movements through the yellow glass which at the same time protects it from the action of the light.

The exposure of the paper can then be made at any time by simply turning glass and shutter attached thereto.

Where an Orthochromatic Screen is used, the extent to which the exposure is slowed thereby may easily be found by taking the Actinometer Time in the ordinary way and again with the Orthochromatic Screen placed over the exposed portion of the sensitive paper. Thus if the screen slows the Actinometer Time say 2, 3, 4, or 6 times, then the exposure for the negative will be slowed in exactly the corresponding degree.

## **2.-The diaphragm or stop employed:**

The instrument is marked with the focal values of the diaphragms in common use, the decimal points, however, being omitted for clearness. The diameters of the aperture are factors of the focal length of the lens employed ; thus, with stop F 8, F 16

and F 32, the diameters of the apertures are equal to the focal length of the lens divided by 8, 16, and 32 respectively.

To find the F No. of an unknown Stop, draw a line equal the focal length of the lens, and set a pair of compasses to the exact diameter of the Stop. Then see how many times the diameter will step into the length of the line. If it steps 10 times the No. is F 10, if 10

times the No. is F 16, if 43 times the No. is F 43, and so on.

To find the focal length of a lens, focus an object 50 to 100 yards distant, and (if a single lens) measure the distance from the lens to the ground glass, and (if a double) from the diaphragm slot or iris diaphragm to the same.

It is most important that the ratios of the apertures should be accurately known.

Many Snap-Shot and some other Cameras have the Stops marked with the U.S. numbers. The following numbers gives the corresponding F numbers :

U.S. 1 = F 4; 2 = F 5 1/2; 3 = F 7; 4 = F 8; 8 = F 11; 12 = F 14; 16 = F 16; 24 = F 20; 32 = F 23; 64 = F 32; 128 = F 45; 256 = F 64.

Dials with Scale of Stops and Speed Cards with Speed numbers according to the U.S. or "Uniform System" are supplied to order.

Spare diaphragms can be quickly made, by cutting them out of thin black sheets of celluloid, and enlarging hole to size required with any pointed instrument.

### 3.-Character of the subject:

The great majority of Photographs (probably 19 out of 20) are either Landscape with strong

Foregrounds, Buildings, Living Objects out of Doors, views under Trees, Shady Lanes, Copying Photographs, Studio Work or Interiors generally, and the instrument is primarily constructed for this class of subjects. The adaptation of the instrument to other exceptional classes of subjects will be treated further on.

### 4.-The sensitiveness of the plate

Instead of expressing the sensitiveness of a plate by an arbitrary number, it is expressed by the size of diaphragm through which the plate would require the Actinome-

ter time for its correct exposure upon a normal subject. Thus Ilford ordinary Plate, No. F 32, means that an ordinary subject upon these plates, through Stop F 32, would require the Actinometer Time for its correct exposure. Similarly-

Mawson's Photo Mechanical Plates	No. F	16
Wratten's Ordinary Plates	No. F	23
Paget XXXXX Plates	No. F	78
Kodak Film	No. F	78

means that each of these plates would require the Actinometer Time for its correct Exposure upon a normal subject through the diaphragm which represents its speed number as above.

If the scales of the instrument are placed in their normal position, as in illustration on Page 1, F 45 (which is the average speed of an ordinary plate) will stand opposite to i, and the comparative speed of any plate will then be simultaneously found opposite its diaphragm number, thus:-

	Diaphragm Speed No.	Comparative Speeds
Paget XX	F 39	3/4
Do. XXX	F 56	1 1/2
Lumiere Ex Rapid	F 78	3
Sandell Perfect	F 64	2
Barnet Ordinary	F 45	1
Wratten Ordinary	F 23	1/4

And so on - see illustration on Page 1 and on Speed List Card.

### TO CALCULATE THE CORRECT EXPOSURE.

Turn the glass carrying the movable scale of the instrument until the Actinometer time in seconds upon the Exposure Scale is opposite the Diaphragm number of the Plate. Then the correct exposure in seconds and fractions of seconds will be found simultaneously against each Stop from the largest to the

smallest; or shortly, you set the one scale, it does the rest.

**Example No. 1:-**

Plate Speed No. F 45.  
Actinometer 12 seconds.  
Stop F 16.

Put 12 seconds against F 45. Then against F 16 will be found 1 1/2 seconds, which is the correct exposure, and also against every other Stop the correct exposure for that particular Diaphragm.

**Example No. 2:-**

Plate Speed No. F 90.  
Actinometer 3 seconds  
Stop F 51

Put 3 seconds against F 90. Then against F 5 1/2 will be found 1/85 of a second, and also against every other Stop the correct relative exposure. If in an interior exposure or an exposure in a shaded situation the sensitive paper takes minutes instead of seconds to colour to the standard tint, the figures upon the Exposure Scale may be read as minutes instead of seconds.

**PHOTOGRAPHING EXCEPTIONAL SUBJECTS.**

The foregoing rule gives the exposure for a normal subject, but the following exceptional subjects require the variations given below:-

For:	Divide Normal Exposure by:
For Cloud Negatives	12
Sea and Sky	10
Ditto, with Ships or light foreground	4
Copying Engravings, &c., in Black and White	4
Snow Scenes, Glaciers, White Statuary	4
Extreme distance in open Landscape	4
Panoramic Views or open Landscape with no dark objects in foreground	2

	Multiply Normal Exposure by:
For Portraits or Groups when at a distance of less than 20 ft. from Camera	1 1/2
For Dark Coloured objects, Old Oak, Oil Paintings, when at a distance of less than 20 feet from Camera	2

When copying (or where the object Photographed is very near), the camera has to be racked out, and the distance from the lens to the ground glass is then greater than the normal equivalent focus of the lens. If this increased distance is less than 1/5 of the normal equivalent focus of the lens it may be neglected, but if the distance is increased

To 1 1/4 times, multiply normal exposure by 1 1/2  
To 1 1/2 times, multiply normal exposure by 2  
To 1 3/4 times, multiply normal exposure by 3  
To 2 times, multiply normal exposure by 4

Good Negatives of Black and White Engravings are much more easily obtained upon Photo Mechanical than upon ordinary Plates.

**PLATE SPEED NUMBERS.**

The list of plate speed numbers is the result of actual camera tests, but as the speeds of different batches of plates by the same makers vary considerably, they must only be taken as a guide. A good plan for a first trial is to make two exposures of the same subject, setting the Actinometer time for one at the number next above the plate speed given, and for the other at the number next below that speed. A comparison of the resulting negatives will then show which is the nearest to the correct exposure, and when once the actual speed which gives the best result is ascertained, a note should be made of it for future use. The list being constantly revised is printed on a separate card.

## INSTANTANEOUS PHOTOGRAPHS.

If the speed of the shutter in fractions of a second is known, the instrument will show at a glance on Time Scale what Stop should be used to give the correct exposure, or whether under the conditions of light at the time it is possible to give sufficient exposure. For instantaneous photographs, if it is found absolutely necessary, the Actinometer time may be set one, or two, plate speed numbers higher than would be calculated for time exposures; but if after doing this the instrument shows that the speed of the shutter is still too quick to give sufficient exposure with the largest stop, it may be concluded that it is useless to attempt an exposure, which would only result in failure through under exposure. The speed of the shutter can be easily and accurately ascertained by making a Trial exposure with the "Infallible Shutter Speed Tester." - See page 33.

The secret of successful exposures to instantaneous photography is: -

Firstly-to use a Rapid Plate and lens capable where necessary of working with a large aperture, not less than F 8.

Secondly - to use a Reliable Shutter.

Thirdly - to use the shutter at the lowest speed the subject will allow.

Fourthly - to use the shutter whenever possible at a constant speed, and regulate the variations of exposure by the size of Stop used. The variations of exposure due to the sizes of Stops can be calculated for exactly, but the variations of the speed of a shutter cannot be so determined without a special test.

Fifthly (and most important) - to use an "Infallible" Exposure Meter, which will show at a glance the proper Stop to use under all conditions.

If the slowest speed of shutter is say 1/16 of a second the Exposure Meter will show at a glance what Stop corresponds with that speed for any set of conditions.

## INTERIORS.

In photographing Interiors, the best method to pursue is to employ a Stop of the same size as the Diaphragm number of the plate used, and uncap the Lens and the Actinometer at the same time, placing the Actinometer in the darkest part where detail is required, but with the sensitive paper turned towards the light which illuminates this part. When the Actinometer has darkened to the standard tint, re-cap the Lens.

If the light is poor and time is an object, the exposure can be expedited by using the lighter tint, of the Actinometer instead of the darker one. As, however, it takes only one fourth of the time to colour to this tint, a Stop four times as large or four numbers lower than the plate speed diaphragm must be employed-the lens being re-capped when the lighter tint is reached, as before explained.

The lighter tint may be used at any time and for any subject if the speed of the plate be calculated as four numbers lower than the diaphragm number given. Thus, instead of calculating Paget XXXXX, XXX and XX Plates as F 78, F 56, and F 39, they must be calculated as F 39, F 28, and F 20, respectively. To avoid complications, however, it is recommended only to use it when the light is very weak.

## ENLARGEMENTS.

In making daylight enlargements the best plan is to always use the same Brand of Plate or Bromide Paper and the same stop in the Lens used for enlarging. This only leaves the two factors of Light and the printing quality of the negative to be taken into consideration.

The actinic value of the light is easily tested by the actinometer as before explained and the printing quality of the negative then only remains to be allowed for.

The simplest method of procedure is to once ascertain by trial the time of correct exposure of all enlargement from a particular negative, and also the Actinometer Time during the Exposure and to mark the Negative with both these Times. Thus suppose the Actinometer Time was 8 seconds and the Time of Exposure 16 seconds the negative should be marked on the edge thus:-

$$\frac{16 \text{ Exposure}}{8 \text{ Actinometer}} = 2$$

If then the Time of Exposure 16 seconds be divided by the Actinometer Time 8 seconds, the result equals 2. This shows that for that particular Negative the exposure for similar enlargements will always be twice the Actinometer Time whatever the latter may be. To take a few other examples.

No.	Exp.	Act.		Correct exposure equals Act. Time
1	4	12	1/3	
2	3	4	3/4	
3	8	16	1/2	
4	16	24	2/3	
5	8	4	2	
6	15	6	2 1/2	

After a few Negatives have been tested and marked, on comparing any new Negative with one of these a very close approximation to its printing quality can be estimated and the correct Exposure given without the necessity of making a special test Exposure. The Meter should be held close to the side of the negative so that the light which falls upon it is of the same intensity as that which illuminates the negative being enlarged.

#### **SIMPLICITY OF INSTRUMENT.**

It will be seen from the foregoing description that the simplicity of the instrument is not attained by ignoring any of the factors of exposure, but by the scales being so de-

signed that each of them represents in itself two or three of these factors.

Thus :- The scale of Diaphragms represents - Firstly, The Scale of Diaphragms, and secondly The Speed of Plate; while the Time Scale represents the Actinometer Time and also the Exposure in seconds or minutes.

The scales are also so divided and arranged that when they are set correctly for one Diaphragm they are simultaneously set correctly for every Diaphragm from the largest to the smallest.

The system of plate speed numbers, the design and arrangement of scales and of the instrument generally, are Protected by the Copyright and Patent Laws, and the advantage arising therefrom are not and cannot be shared by any other system.

#### **DIRECTIONS AS TO USE OF METER.**

The Case is in two parts, the upper carrying the scales and the lower one the spare store of sensitive disc, and felt pad for pressing the sensitive paper, dial plate and glass against the bezel, end against each other, and also for turning the disc of sensitive paper which is in use.

To open the case, hold the ring attached to bezel by the thumb and finger of right hand and press the thumb nail of left hand against the edge of the milling upon lower half of case, when the two halves will separate. If preferred, the case may be easily opened by putting the edge of a penknife blade between the little knob and the edge of the milling upon the lower half of the case, and giving

the blade a slight twist. The used disc of sensitive paper can then be removed, and a new one substituted, placing it flat upon the felt pad. Be sure to see that the small pin in bezel engages in the slot in dial plate. Then place the bezel containing the dial on the lower part of the case and snap the two halves together by pressure of the fingers.

The operation of changing the disc should be carried out in a subdued light in a room, or by gas or lamp light.

To expose a fresh surface of sensitive paper, hold the milled edge of the lower part of case between the thumb and finger of the left hand, and turn the upper part a short distance with the thumb and first finger of the right hand. To turn the glass carrying the scale of Diaphragms, hold the case as before explained and turn the glass by placing two opened fingers of the right hand upon opposite sides of the glass. On exerting a slight pressure, the friction of the fingers upon the glass will be found amply sufficient to turn it round and set the scales as desired.

If at any time you have the least difficulty, or do not clearly understand any point, please communicate direct with us and we will put you right.

**A NEW SHUTTER SPEED TESTER,  
"The Infallible."**

Invaluable for easily finding out the different speeds at which the Instantaneous

shutter is working. No more guess work, often very wide of the mark. Price in polished Nickel, 3/6 each, complete.

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The "Infallible" Exposure Meter is an Infallible and Instantaneous Guide to Correct Exposure under all Conditions :-

From the Poles to the Equator.  
" Sunrise to Sunset.  
" Brilliant Sunlight to Fog.

For Instantaneous or Prolonged Time Exposures.

" Open Landscape or Dense Woodland.  
" Photographic Studio or Dimly Lighted Interior.  
" Copying or Enlarging.  
" The most rapid or the Slowest Plates.

And with all Diaphragms, from the largest to the smallest.

Correct Exposure found Simultaneously for every stop by the simple movement of the one Scale.