

**SMETHURST
HIGH-LIGHT**



**EXPOSURE
METER**

British Pat. No. 458546, others pending.

The word "AVO" is our registered Trade Mark.

Manufactured by:

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CONTRACTORS TO : The Admiralty, War Office, Air Board, G.P.O., India Office, Crown Agents for the Colonies, and the principal Telephone Companies throughout the world.

1M.3.46



INSTRUCTIONS FOR USE

SPECIAL NOTE.

THIS exposure meter is specifically designed for use with amateur cinema film and with all colour processes, on which it gives natural and matched results with uncompensated processing after exposure. Since the instrument requires totally different handling from ordinary photo-electric exposure meters, it is essential that the user read the instructions below before attempting practical work.

1. GENERAL.

The Smethurst High-Light Exposure Meter takes a reading on a standard subject or "artificial high-light," and not of the light reflected from the actual scene in front of the camera. The artificial high-light is built into the body of the meter, and will be seen at the front of the instrument in the form of a white translucent glass, which *must always be turned to face the strongest light reaching*

the scene to be photographed, as described in detail below. If the meter is pointed at the object to be photographed in the manner usually associated with photo-electric exposure meters, incorrect readings will result.

The meter is a precision scientific instrument, giving extremely accurate readings, and it should be treated with care and respect. Shock and jarring may damage the internal mechanism, and a fall to the floor may do considerable damage to the sensitive components.

2. SETTING FOR FILM FACTOR.

Before the meter can be used for practical work, it must be set to give correct exposure for the particular film in use. The table herewith gives factors for the films in general use, and it should be particularly noted that different factors are required for daylight and for artificial light.

On the face of the meter will be seen a star shaped knob which carries a calibrated disc held friction tight. This disc is marked with a series of lens apertures (f numbers) on its upper edge, and a scale of film factors on the lower edge. The lens apertures appear against an outer fixed scale of camera speed and exposure times, while an index pointer on the knob indicates the film factor.

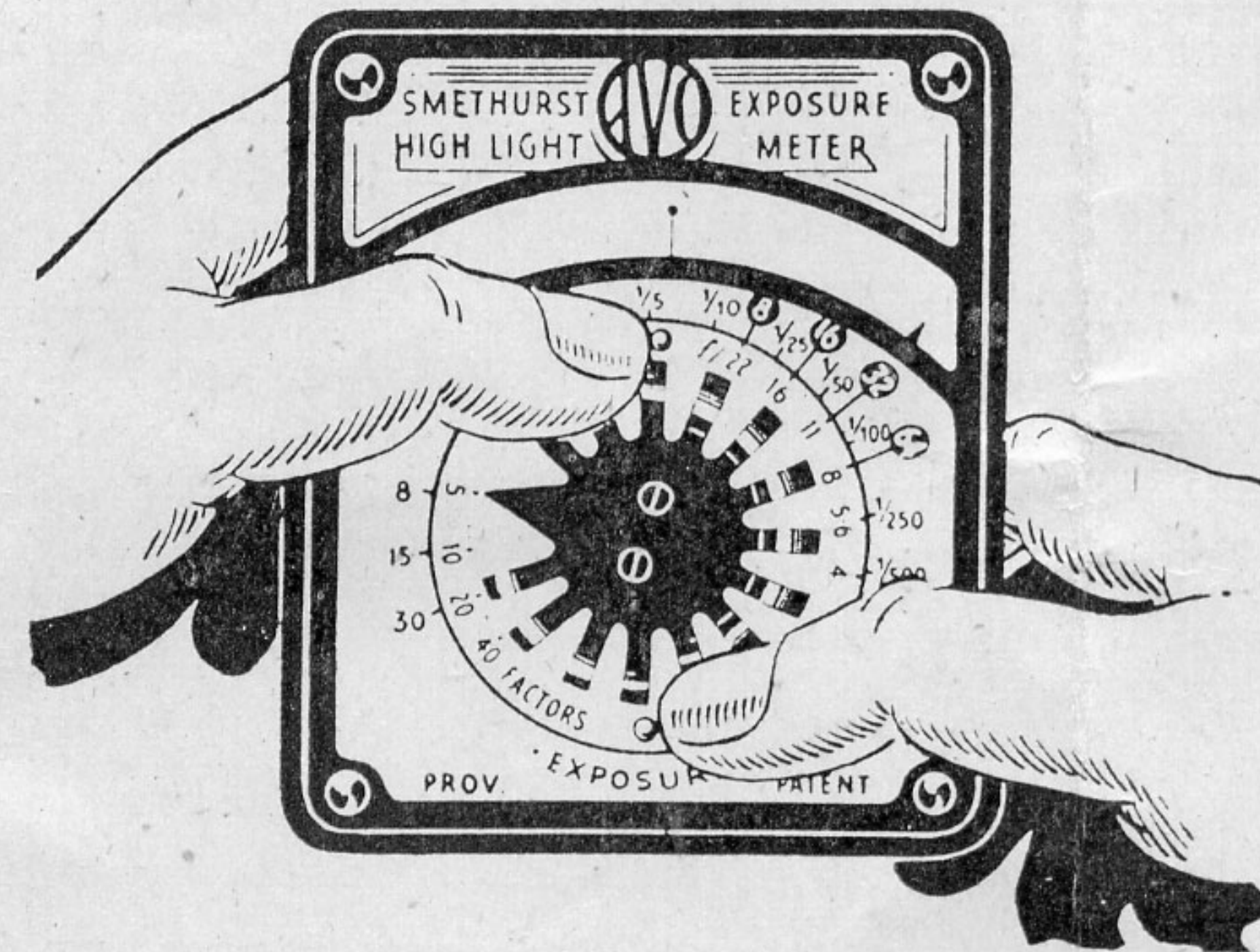
The setting for film factor is carried out by rotating the knob to its extreme position and then twisting the calibrated disc by means of the two projections until the index pointer is against the factor of the film to be used.

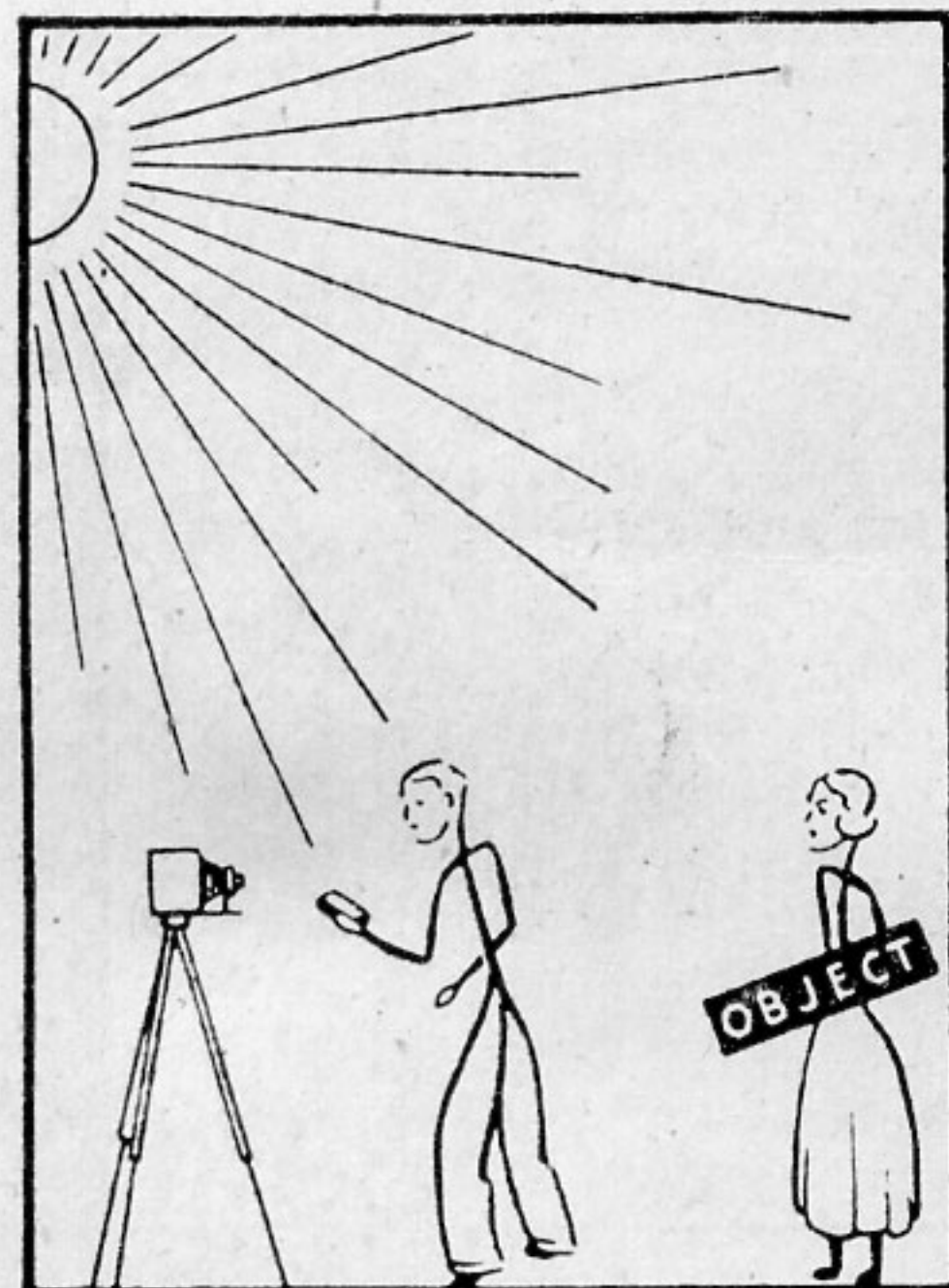
The various films listed have each been given a factor, this grading being necessary so that correct exposure may be given to produce uniformly good results with uncompensated processing. These factors have been determined experimentally to give an image of average density, but should individual taste suggest a slightly different density, this can be produced by setting to a lower or higher factor depending on whether a lighter or darker image is required.

It is very convenient when taking the first film to expose one or two shots not only at the meter reading, but also at half (one stop narrower) and twice (one stop wider) this exposure value. The three exposures constitute a "speed test," and thus by a small alteration of the film factor if necessary the exact image quality desired can be produced at will, assuming that uncompensated processing is used. Once the meter is set for the correct factor, it should not be altered unless another type of film is used.

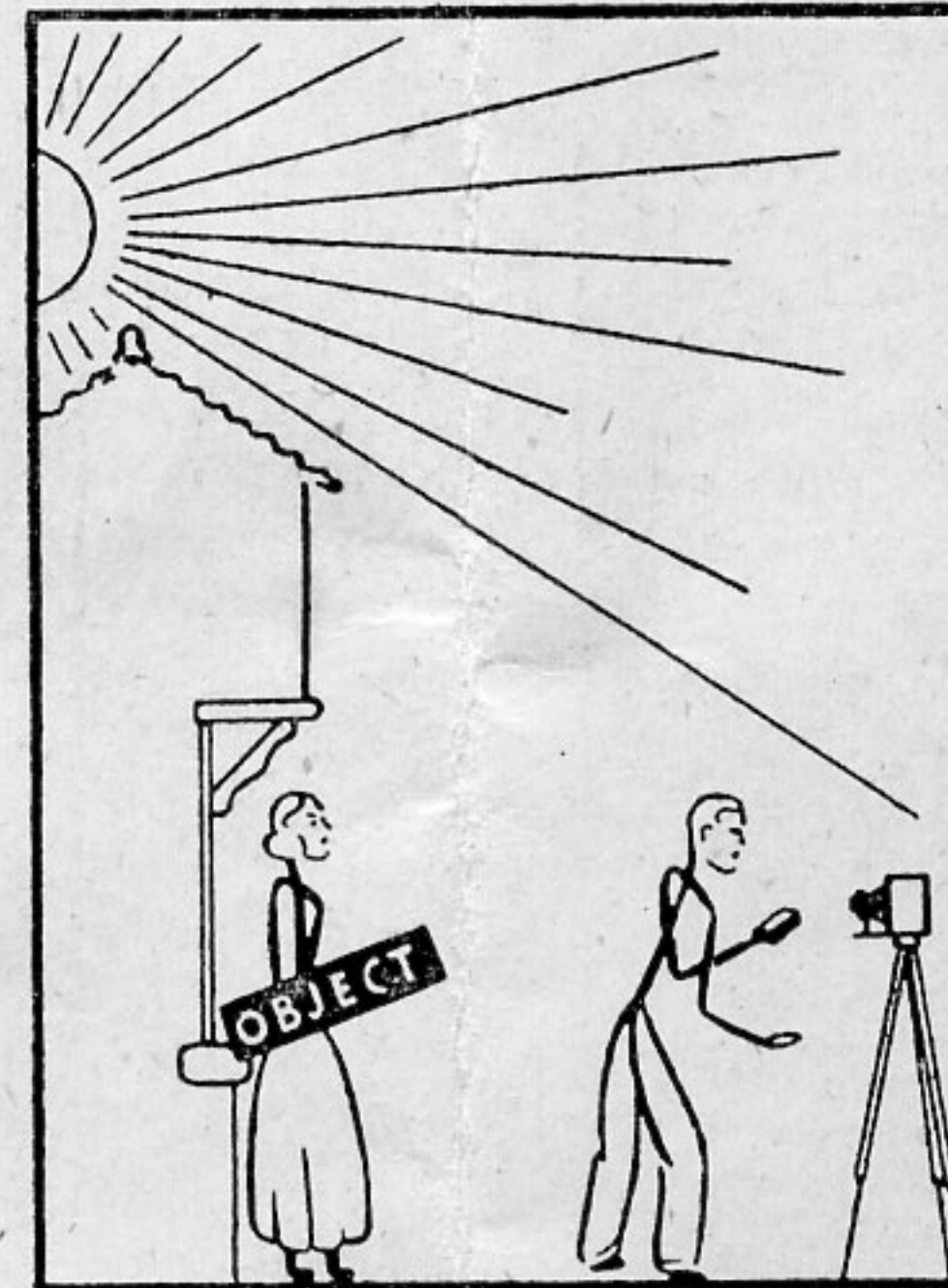
3. TAKING A READING.

After setting the meter to the correct factor, it may be turned to face the light according to the instructions given below, and the pointer will be seen to move from left to right. This is the pointer of the electrical measuring instrument operated by the photo-electric cell, and the brighter the light reaching the artificial high-light of the meter, the farther to the right will the pointer move. To take a reading, the knob with its calibrated





A. Sun Reading



B. & C. Sky & shade reading
When taking shade reading ensure no sun strikes artificial H.L. ; hold meter in shade of body.



D. Object position reading

dial is rotated bodily to left or right until the black wedge-shaped indicator in the window lies over the pointer. The stop can then be read against the shutter speed being used.

4. READINGS IN DAYLIGHT.

In use, the meter is always held pointing upwards at an angle of approximately 45° as shown in the illustrations, and it must always face the strongest light reaching the object. In most cases it will not be necessary to take the meter to the position occupied by the object itself, since in the open the light is the same strength at the camera position as at the object, and the readings in the two cases will be identical.

The following rules should be observed:
A. When the sun strikes the object directly, point the meter at the sun (Sun reading).

B. If no sun shines, the meter must face the sky in front of the object, i.e., the back is turned on the object and the meter pointed at the sky (Sky reading).

C. If the sun is shining but does not strike the object (e.g. the object is in shadow) point the meter at the sky in front of the object, and shade the sun from the meter while taking a reading (Shade reading).

D. Under trees, and in some other shadow conditions, the light varies very greatly from point to point. Under such conditions the meter must actually be placed in the position occupied by the object to be sure that the correct light is read (Object position reading).

In all cases of doubt it is wise to use this position for the meter during a reading.

RECOMMENDATIONS.

Where the sun is right behind the object, a sun reading will give a silhouette effect, with dark shadows. Should it be necessary to match (say) the face tones in these shadows with face tones in other shots taken under different conditions, a shade reading or sky reading may be taken as described above. If this is done, the background of the picture will appear over-exposed and burnt out, but

this often gives a very happy effect by increasing the perspective of the shot. If the sun is rather to the side, behind the object, this latter procedure will naturally burn out by over-exposure any portion of the face seen by the camera that the sun strikes directly.

In early morning, or late evening, it sometimes happens that the sky is very blue, and when the sun falls on one side of the object a sun reading will show the shadows exceedingly dark. This trouble is due to excessive contrast, and not to incorrect exposure, because the brightest parts of the picture will be correctly rendered. A shade reading, on the other hand, will burn out the brighter parts of the picture, and a reflector is the true solution to the problem.

Filters are used in the ordinary way, and are extremely valuable to produce better image quality on all scenes that have little contrast. Beach scenes in particular should always be filtered, as also should sea and sky (cloud effect) studies. The exposure is determined by meter as usual, and then multiplied by the ordinary filter factor.

5. READINGS IN ARTIFICIAL LIGHT.

In artificial light the meter must always be used in the object position, since great variation in light intensity will be found when comparatively low-power lamps are being used close to the object. Following the normal rule, the meter is always pointed at the brightest light when taking a reading.

The chief difficulty in artificial light lies in the very strong contrast that normally arises, and in this case it is useful to use the meter as a means of finding the lighting contrast present. (Lighting contrast is the difference in strength between the light reaching the brightest-lit and darkest-shadowed portions of the scene.) It will be remembered that the meter is fitted with an artificial high-light so that differences in light strength may be read on it as differences in exposure values. In daylight the lighting contrast is the difference between sun and shade readings, and it has already been noted that when the shade reading is very low compared with the sun reading (the case of bright sun and deep blue sky in early morning or late evening) the

shadows are liable to be very dark. As a general rule in artificial lighting it is not advisable to use a shadow light that is less than one quarter the strength of the brightest accent light (i.e. 2 stops) unless special effects are required. The lighting contrast is quite simply measured by taking readings on the brightest accent light and then turning the meter to read the light reaching the shadow side of the object. If the readings are one stop number different, the lighting contrast is 2 to 1, and if two "stops" difference is found, the accent light is $2 \times 2 = 4$ times the strength of the shadow light. By this method the shadows can be lit just as light or dark as is desired, and a few experimental exposures will soon show what difference between accent and shadow readings is required for any particular effect.

6. AFTER EXPOSURE.

In view of the fact that the Smethurst High-Light exposure system uses factors as a means of obtaining the particular image quality desired, uncompensated processing

should be given to High-Light exposures. Since there are slight variations between different batches of film emulsions, it is essential to return the film for processing in the same carton in which it was delivered. This is most important. A booklet of adhesive labels for attachment to films being sent for processing is supplied with each meter. Additional booklets may be obtained at 3d. each post free.

After the first film has been returned from processing, it will be apparent whether the exposure standard given by the meter at the usual factor is too light or too dark for the personal taste of the user and for the power of his projector. Should the image be too dense, the factor on the meter must be reduced, and if the image is too light, it should be increased.

7. SPECIAL EFFECTS.

It sometimes happens that advanced workers wish to produce special effects in their exposures, and the Smethurst High-Light Exposure Meter will produce them

without the slightest trouble and with extreme accuracy. It has been noted above that lighting effects of any required kind can be produced by making the shadow light have some definite relation to the accent light, and this process can be extended to cover special effects as well. The following table, which is suitable for super-speed films, gives the appearance of the image when the camera is set to the same, or to a different stop from that indicated by the meter.

Take, for example, the column "accent light," and assume the meter indicates that the stop $f/8$ should be employed for normal accent. Suppose now, that for pictorial reasons a very strong accent light is thought desirable, the camera aperture should be opened one stop, i.e., to $f/5.6$, without alteration to accent light, or alternatively, the accent light increased two-fold, i.e., until meter reads $f/11$, the camera being set to $f/8$.

After decision as to the stop to be employed, separate adjustment of shadow and back lighting should be carried out to produce

the effects sought after, which are shown in their respective columns. In the above case, let us suppose that it had been decided to enhance the accent light by using stop $f/5.6$, and that very dark, dense shadows are required. By reference to column "Shadow Light" it will be seen that this effect is produced by adjusting the shadow illumination to a value equivalent to opening the camera aperture two stops, i.e., camera is set at $f/5.6$, therefore shadow lighting on meter should be $f/2.8$. The back lighting should then be dealt with in the same manner.

8. SPECIAL SUBJECTS.

It sometimes happens that on some particular subjects a variation of exposure from the normal meter reading is required to produce a natural image. As a rule, the image quality most suitable to faces and ordinary every-day objects is very much lighter than in actual life, so that all very light objects are liable to burn out to some extent. This is quite unnoticeable as a rule, but it may be found that when printed matter—such as a

newspaper—is included in the picture it is very difficult to read the text.

Thus, it is usually advisable to give half the indicated exposure on the meter for news-print and similar subjects, as well as for black-on-white or white-on-black titles. Where a newspaper must be included in the same shot as a human face, it is necessary to shade it from some of the light reaching it if the text is to be fully legible, yet the face of normal image quality. This is quite a simple process, but is by no means always necessary.

The same variation of exposure should further be given for snow scenes, though since it is here impossible to vary the light reaching the snow and maintain the full illumination of faces, the latter are bound

to appear rather too dark. This effect will always be noticed unless special make-up is used, and is a familiar feature of alpine photography.

9. ENQUIRY BUREAU.

In view of the fact that the Smethurst High-Light Exposure Meter operates on a completely different basis from the ordinary photo-electric meter, it is possible that the user may at first be a little confused. The manufacturers have therefore arranged with Mr. P. C. Smethurst, the originator of the system, to give advice to those in difficulties through their own enquiry bureau. Letters should be addressed to the firm and marked "Enquiry Bureau."

SMETHURST HIGH-LIGHT FILM FACTORS

THESE factors have been determined experimentally and are arranged to give one particular image quality of general suitability with uncompensated processing. They are not speed numbers, and do not give any indication of the minimum exposure that can be given to the films below to produce a satisfactory image.

I. REVERSAL & COLOUR FILMS.

Film:	Factor in:	
AGFA :	Day-	Half-
	light	watt
8-mm. panchromatic reversible ...	7	5
Isopan F 16-mm. reversible	10	10
Isopan ISS reversible	15	30
Agfacolor 16-mm. film.....	4	—
Agfacolor 35-mm. film.....	8	—

DUFAY-CHROMEX :

Dufaycolor daylight grade D/1...	5	1
	(2½ Photoflood)	
Dufaycolor photoflood grade D/3	—	4
	(8 Photoflood)	

GEVAERT :

Orthochromatic reversal	7	3
Microgran pan. reversal	7	5
Superpan reversal	10	20

KODAK :

16-mm. panchromatic reversal ...	7	6
8-mm. panchromatic reversal ...	5	4
S-S panchromatic reversal	12	20
Super XX reversal	30	40
Kodachrome (daylight grade) ...	5	—
Kodachrome A (artificial light) ...	—	17

PATHESCOPE :

SO	8	—
S-S	12	18

SELO :

16-mm. panchromatic reversal ...	7	14
9.5-mm. panchromatic reversal ...	5	10

The factors given above are averages only : factor values may be affected by :

- (1) Camera shutter opening (basis here is $\frac{1}{2}$ second).
- (2) Camera running speed (basis here 16 frames a second).
- (3) Slight variations in meter sensitivity as delivered.
- (4) Larger or smaller projector lamp intensity than usual. (Basis here is 250 watts).
- (5) Differences in opinion as to what constitutes a perfect image.

The films above are processed by their manufacturers : other films vary in effective factor value to some extent according to the firm which processes them.

THE RELATION BETWEEN LIGHT INTENSITY AND IMAGE APPEARANCE IN-A
SUPER-SPEED TYPE FILM.

LIGHT INTENSITY AS READ BY METER	ACCENT LIGHT	SHADOW LIGHT	BACK-LIGHT
2 stops less than camera aperture (e.g. f/2)		Very dark dense shadows.	
1 stop less than camera aperture (e.g. f/2.8)	Very dark low - key accent light.	Dark shadows but with full detail.	
Camera Aperture (e.g. f/4)	Normal accent on brighter side of face.	Shadows as bright as normal accent light. (High-key).	Back-light noticeable but not strong.
1/2 stop more than camera aperture (e.g. f/4.5)	Strong accent for high -key shot.		Pleasant back-light.
1 stop more than camera aperture (e.g. f/5.6)	Stronger accent, burn- ing out details.		Strong halo, just start- ing to burn.
1 1/2 stops more than camera aperture (e.g. f/6.8)			Brilliant halo, well burnt out.

The above values are only approximate, since the various makes of film differ in contrast to some extent. The figures given will, however, prove satisfactory as a basis for trial.