

## TECHNICAL SECTION

### 2. ARCHAEOLOGICAL PHOTOGRAPHY

By SQUADRON-LEADER M. B. COOKSON, R.A.F.

*It is unnecessary to stress the high importance of good scientific photography; nevertheless, inadequate photographs are excessively abundant in archaeological reports, and these notes may be of use as a reminder of some of the essential factors involved. Squadron-Leader Cookson has had many years' experience as a photographer to archaeological expeditions and as an instructor in archaeological photography.*

#### A.—GENERAL

1. To-day lenses, cameras and material can be accepted as almost perfect. The standard of photography depends therefore upon the knowledge and judgment of the individual photographer more than upon his equipment. We may have complete confidence in our materials; it remains to understand fully how much can be done with them, i.e. in what way we can press these tools into the fullest service. Accepting that camera-manipulation is now automatic, then the whole of the mind can be given to the production of a photograph which (a) is a good, sharp, clear record, (b) tells at a glance what has happened in the archaeological sequence, (c) has artistic merit, and (d) having all these things becomes, on reproduction in the final report, a piece of work to which to turn with pride.

2. Assuming that the finished photograph has all these things, let us look back and see how the result was achieved. It was not done alone; it involved co-operation with site-supervisors, knowledge of the site and all its peculiarities, the maintenance of photographic site-notebooks for personal reference, and keeping up-to-date with work. The notebooks will also provide data for future photographs and possible retakes, since it will contain all details relating to time, position, exposure and filter used. Thus:—

Ranchi
Site E. Sect. X. South face
11.45 hrs. Strong sunlight
10" lens. Red filter. F. 22. 3 secs.

#### B.—EQUIPMENT

3. The archaeological photographer in the field needs the following equipment:—
1. Stand camera (for full plate, half plate and quarter plate).
  2. Four lenses (short, middle and long focus, and telephoto).
  3. Three filters (green, yellow and red).
  4. Bubble-level.
  5. Assorted scales, including two or three small scales divided into inches and centimetres.
  6. Pair of scissors.
  7. Lump of plasticine.
  8. Exposure metre.
  9. Pocket camera and spare films.
  10. Sheet of glass for photographing small finds.
  11. Sheet of black velvet for ditto.
  12. Notebook.

C.—ADMINISTRATION AND RECORD KEEPING

4. Another essential is ease of access to negatives, and, to this end, all negatives made and approved should be numbered with a Serial No., orientation, the page in the site-supervisor's notebook, and, if possible, the position on the site and the general plan or the Drawing No. (see below). It is quite simple to do all this in the rebate or margin made by the dark slide, and the work should be carried out with waterproof ink and a mapping pen. If cellophane envelopes are used for storing negatives, then the same details will be added to the envelope, together with the type of printing paper used in the print produced. Thus, if the Negative Register is ever lost or destroyed, the details would still be available. In the same manner the keeping of a *Negative Register* is essential, columnized to receive all the foregoing details but with an added 'Remarks' column in which notes can be made of such matters as the existence of lantern-slide negatives of the same subject, or whether the negative has been used for publication, the date and reference of publication being given.

DIAGRAMMATIC EXAMPLES

NEGATIVES

NEGATIVE BAG

237. RANCHI. SITE E. SECT. X.	N.B. 10. P. 41. DRWG. No. 15.
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237 RANCHI SITE E. SECT. X SOUTH FACE HUMUS REMOVED NOTEBOOK 10. P. 41 DRWG. No. 15 KODAK BROMIDE GRADE 5 10 SECS.
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NEGATIVE REGISTER

RANCHI

Neg. serial	Site	Section	Drwg. No.	Sup. N. Bk.	Remarks
237	E	X South face	15	10 P. 41	Humus removed. Interim Report pl. CX. Lantern-slide made.

D.—EXPOSURE AND PRINTING

5. *Exposure*.—It is preferable to *over-expose* a plate or film rather than to *under-expose* it.

Except for a highly experienced photographer, it is wrong to under-develop, because a fully-exposed negative, fully developed, can be reduced chemically, or a different speed of printing paper may be used to correct a dense negative.

6. *Printing paper*.—The quality of the negative decides the type of printing paper to be used. There are four kinds of printing paper, and their use is as follows:—

- (1) *Soft grade paper*, used for hard, somewhat dense negatives in which the high lights are clogged or dense and the shadow-detail obscured.
- (2) *Normal grade paper*, used for a normal negative with average tone-values.
- (3) *Contrast grade paper*, used when negatives lack adequate contrast between high lights and shadows.
- (4) *Super-contrast paper*, used with thin, weak negatives, or for printing photographs of outline plans and drawings.

7. *Glazing*.—For purposes of reproduction, prints should be glazed. This can be done by (a) hardening them in a saturate solution of alum or a 20% formalin bath; (b) then rewashing them in water; (c) then placing

them face-down on a clean and well-polished sheet of glass until dry. If they stick to the glass, prints can be removed without damage by soaking the back in water; this will save the print but will remove the glaze.

8. *Halation*.—When photographing within 45 degrees of the sun, it is essential to shade the lens during exposure to avoid halation. A hat or book or sheet of cardboard will serve the purpose.

9. *Levelling*.—It is important that, before exposure, the base of the camera should be *carefully levelled* in both directions with a bubble-level.

#### E.—LENSES

10. There is a general tendency to use lenses with too wide an angle or too short a focal length. Such lenses facilitate the inclusion of the subject within the limits of the plate, but only by sacrificing true scale and perspective. A wide-angle lens will flatten and distort the subject, and so falsify it and generally weaken it. The golden rule is to use a lens with as *narrow* an angle as possible, i.e. with as long a focal length as possible.

It is recommended that not less than *three* lenses be included in the equipment of the archaeological photographer for a whole-plate camera, e.g. (1) 7 to 8 inches focal length (wide angle); (2) 9 to 9½ inches focal length (medium angle); 12 to 14 inches focal length (narrow angle). A telephoto lens is a useful addition.

#### F.—FILTERS

11. The photographer must be prepared to use filters or colour-screens to emphasize certain groups of colours, e.g. in photographing a stratified deposit. The use of filters necessitates a longer exposure according to the colour used. The following filters should be included in the equipment:—

- (1) Green filter, necessitating an exposure 6 times as long as the normal.
- (2) Yellow filter, necessitating an exposure twice as long as the normal.
- (3) Red filter, necessitating an exposure 4 times as long as the normal.

The above multiplying factors apply only when panchromatic or red-sensitive plates are used. With orthochromatic or yellow-sensitive plates, only green or yellow filters are effective, and the multiplying factors are as follows: with green filter, the exposure will be 9 times the normal; with yellow filter it will be 5 times the normal.

The general effect of the green filter with panchromatic and orthochromatic plates is to eliminate greens and yellows and thus to emphasize reds and blacks. The yellow filter with panchromatic plates will reproduce colours with the tone-values observed by the naked eye. With orthochromatic plates it will lighten yellows up to light orange, and will darken all blues. The red filter (used only with panchromatic plates) will lighten all reds and yellows, darken all greens and blues, and will separate red from black.

#### G.—SCALES

12. The importance of a scale or scales in photography cannot be over-emphasized. Whether the photograph be a general view or a 'close-up' for minute detail, a scale should always be added, placed in such a manner that it is unobtrusive, yet there when required. A formula for scaling cannot be laid down, but there are one or two points which should be observed:—

- (i) A large general view of the site may require three survey poles, placed respectively in the foreground, the middle distance and the far distance, in order that each portion of the photograph may have its own appreciation of size, according to its distance from the lens.
- (ii) A close-up or a small area will require only one survey pole.
- (iii) 'Finds' such as pots *in situ*, small ironwork and other small objects will require only a small scale.
- (iv) The scale can be easily constructed of wood painted alternately black and white, carefully sectioned in inches or feet, centimetres or metres.
- (v) It is important that an upright scale should *appear vertical in the photograph*. If the camera is tilted the scale will have to be tilted proportionately.

It remains then that each photograph must have a scale, and that the scale should be suitable to the type of photograph, the guide being common sense and a sense of what looks correct. Should the human figure be used, IT MUST HAVE THE APPEARANCE OF BEING EMPLOYED, i.e. should not be staring at the camera but should be posed in the action of doing something. Neither should it be exactly in the centre of the picture, but slightly to one side. In all cases there MUST be a scale, whether human or linear.

## H.—LANTERN-SLIDES

13. If care must be taken in making a negative or a print, even greater care must be taken in making lantern-slides, by reason of the very great enlargement which takes place in their showing. A lantern-slide may be regarded as a photographic print on glass, but the actual size is now only  $3\frac{1}{2}$  inches, whilst its ultimate projection may become 9 or 10 feet on the screen or at least 40 diameters. The slightest dust-spot or pinhole is therefore enlarged at least 40 times.

14. There are two methods of making lantern-slides from ordinary negatives; either to re-photograph a good print on a lantern-slide negative, or to reduce the original negative to lantern-slide size in an enlarger.

Lantern-slides are made from book illustrations, etc., by photographing on a lantern-slide negative.

15. To avoid eye-strain and keep attention, the tone of the slides should not be kept to black and white, but should vary with the type of picture, brown or sepia being used for suitable subjects.

16. When a particular slide is required more than once during the same lecture, it is preferable to have duplicate slides inserted in the correct places to enable the lecturer to proceed smoothly without waiting or fumbling for a previous slide.

17. All slides should be viewed, if possible, through the lantern before being handed over to the lecturer.

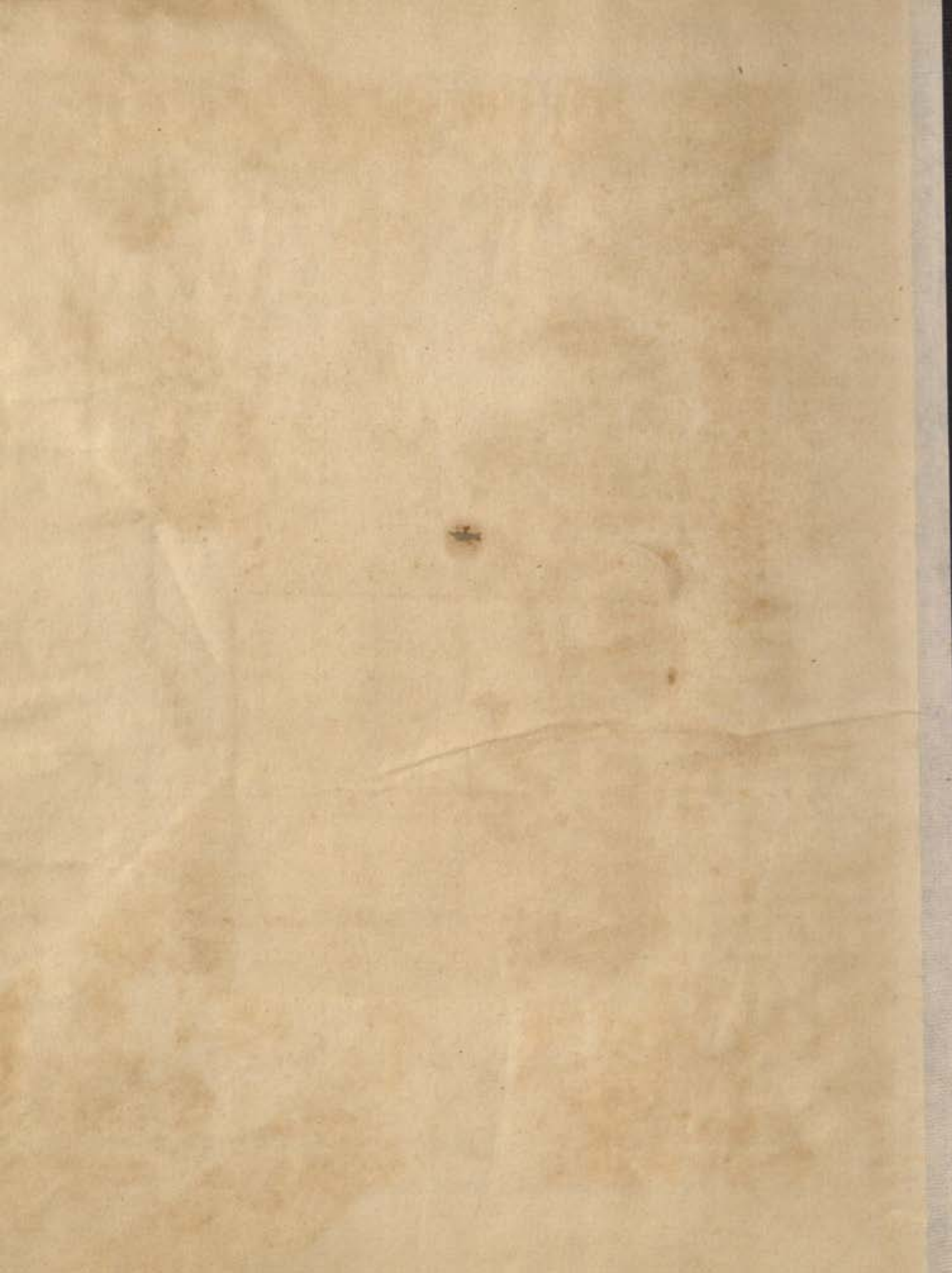
18. Slide negatives can always carry the original negative number, and an indication that a slide has been made should be included in the negative register.

## I.—CONCLUSION

19. In the foregoing notes the *importance* of the work of the photographer has been stressed. Almost everything depends on good craftsmanship and pride in the production of first class photographs. The final photograph appears in published form and may go into every corner of the scientific world; therefore it has to be perfect. It must tell its story at a glance, it must be technically correct, it must be a first-class print from a first-class negative. A good clear record, if possible with artistic merit, can only be obtained by constantly watching the site, the changes made by a changing light on the subject, absolute cleanliness, and care and attention to small details; precision, fidelity and sincerity in all work, and justifiable pride in the knowledge that your photograph is an essential factor in the science which you serve.







*"A book that is shut is but a block"*

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