PHOTOGRAPHY IN WET CAVES

by

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(Assistant: Frank Brown)

My own experience of cave photography has been restricted to Great Britain, France and Tasmania, where humidity always approaches 100%. Under these conditions the effects of breathing, wearing damp clothing, or worst of all smoking, are to produce a fog which can significantly affect visibility under certain lighting conditions. This can be very noticeable to a wet caving party in a show cave. Where they use their own headlights fog is a serious problem, but when they reach the illuminated section the fog apparently disappears. Similarly, a flash mounted on the normal accessories shoe is likely to give serious fogging (Fig. 1).

In this diagram the formation 16 feet from the camera is correctly illuminated. The light intensity in the space S immediately in front of the camera lens and six inches from the flash will be approximately a thousand (32^2) times brighter than this. If there is nothing in S this will of course not affect the resulting photograph. Even if we are smoking, the proportion of S occupied by water droplets is very small, but when these droplets receive a thousand times the correct exposure they give the effect of a uniform bluish haze over the whole picture. Contrast is reduced and colours are washed out.

There are various ways of arranging the lighting to reduce this effect. One method is to move the flash further back, compensating by increasing the aperture. This is recommended by photographic professionals with no caving experience as it gives even overall lighting with no 'hot spots' (Fig. 2). The fog is illuminated only slightly more than the subject, and unless very thick it will have little effect on the final result. However, this result will vary from unsatisfactory to completely confusing. The centre of interest may be correctly exposed, but will be masked by overexposed foreground, and in a passage 'foreground' can be everywhere except in the centre.

Any method of lighting other than the two described should give acceptable results. A real cave does have a 'hot spot' – the viewer's headlight – so why not put one in the picture. Generally it is best to avoid two 'hot spots'. Psychologically this gives two centres of interest which only a first rate artist may be able to combine into an outstanding picture. A comparison of results produced by a single light source with those from multiple light sources seems to suggest that cave photographers are not first rate artists.

Essentially there are two types of photographers.

The first is the portfolio type who is attempting to get a single slide which will carry off all the prizes at competitions. He needs plenty of money for gadgets and several helpers to act as porters and models. Normal caving parties avoid portfolio types and the rest of these notes do not apply to this class of photography.

The second type is the documentary type who is attempting to record caving as an activity. This can only be attempted by a photographer who is not a nuisance to a caving party. Cavers like being photographed, particularly in exhibitionist postures on overhangs. However, most people are not prepared to wait very long in this sort of position. If the photographer has to call for extra light to be shone on the model so that he can use his range finder he is likely to lose the model in one way or another. Also an exploring party has plenty to carry without helping with photographic gear. This means an active caving photographer must have the strength of mind to scrap everything but the bare essentials of a simple camera and lighting set up. He may be pleasantly surprised to find that simplifications forced on him by necessity improve the quality of his results.

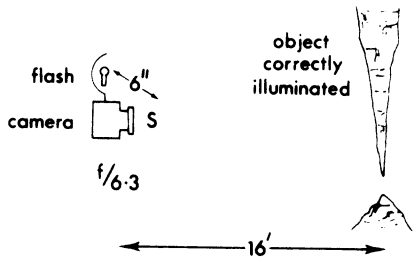

fig. 1 Flash mounted on camera
Light intensity at S is 1000x that at object

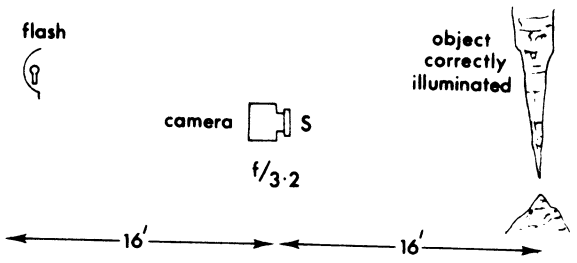

fig. 2 Flash well behind camera
Light intensity at S is 4x that at object

Complete inventory of materials required for documentary work

1. Camera in ever ready case worn under overalls.
   2 plastic bags to waterproof camera in emergency.
   I waterproof ammunition tin ONLY if the cave is very wet and tough, e.g. Herberts Pot, Mole Creek.
   OR
   1 diver's camera instead of all the above.
2. Enthusiastic assistant with experience of cave photography equipped with a capacitator flash firer and a 2 oz. tobacco tin of P.F.1B flash bulbs.
3. 1 caving party with some idea of how you intend operating.

Notes:

(a) The photographer normally provides film and bulbs and owns the copyright on any results, but these results are the product of a joint effort and all members of the party are entitled to copies at cost.

(b) If the photographer wishes to retain the co-operation of his models he must not only be able to focus instantaneously by guesswork, but also be prepared to point and fire without worrying unduly that nothing can be seen through the viewfinder. A moderately wide angle (35-40 mm) reduces the chance of decapitating the subject and gives more depth of focus. A high speed film will allow the use of smaller apertures to compensate for focusing errors.

The system in action

The assistant must be able to judge distances since he is responsible for the accuracy of the exposure. As a general rule he will be between the camera and the centre of interest, which will appear as though lit by his headlight. It is better to avoid calculations during a series of action shots. For example, to get a climbing sequence along the river passage of Kubla Khan, the order of progression would be actor, assistant, photographer. Assuming a flash factor of 100, the camera is set at bulb f/8, 12 feet, giving a depth of field between six and sixty feet (35 mm lens). The assistant keeps about 12 feet behind the actor while the photographer is free to pick the most suitable position without needing to re-adjust any camera setting. When the photographer is in a good position he shouts 'photograph' and blows a single whistle blast if necessary. The assistant feels for the switch on his helmet mounted flash and calls 'ready to fire'. The photographer calls 'shutter open', while the actor continues to move. Immediately the flash has fired the photographer calls 'shutter closed' and blows two whistle blasts. The whistle signals are used in noisy passages to prevent a light being pointed at the camera while the shutter is open. The whole party must know exactly how the process operates. The shutter may be open for as long as a second, and inevitable camera movement during this period will cause any light pointed at the camera to give a pattern of zigzag streaks over a considerable part of the slide. The assistant changes the bulb before moving on, so that the whole process hardly causes a check to the movement of the party. An experienced assistant can cling to the wall with one hand while shorting the flash contact onto the reflector, but nevertheless we find that the convenience of a switch is worth having.

Anyone considering trying this system will have noticed that the difficulties are ones of personnel rather than of equipment. Any assistant worth having must be a competent photographer in his own right and as such will want to bring his own camera. It may help to persuade him to co-operate when he realizes that he will be the silhouette in all the impressive action shots. The party should decide that although any member may carry a camera for static (portfolio) photos, only one camera will be used for action sequences.