

## COMPARATIVE COSTS—Continued.

	£	s.	d.	£	s.	d.
Glass Measure (10oz.) ..	—	—	—	0	2	6
Stirring Rod ..	0	0	6	0	0	6
Printing Frame ..	0	1	0	0	2	0
*Plates (1 dozen) ..	0	1	3	0	2	6
*Developing Tabloids ..	0	1	6	0	1	6
*Hypo ..	0	0	3	0	0	3
*Printing Paper (22 pieces)	0	1	3	—	—	—
*Printing Paper (10 pieces)	—	—	—	0	1	3
Totals ..	£3	5	6	£7	0	0

\*Renewals will be required:—Quarter-plate, 4s. 3d; half-plate, 5s. 6d.

Cost of producing a first print:—

Quarter-plate, approximately .. 2d.

Half-plate, approximately .. 4d.

Subsequent prints will cost less (about 9d and 1s. 4d. per dozen.)

## Some Notes on Pinhole Photography.

## Introductory.

I have often wondered why so few photographers have made use of a pinhole for the purpose of making pictures by photography. It is thought by many that the pinhole should be a child's toy when it is beginning to experiment. Nothing of the kind. It is a most useful tool in experienced hands. There seems always to be, even amongst experienced workers, an undue striving for that sharp, crisp definition which can only be obtained with the best of lenses and perfect focussing. But surely in pictorial work such critical definition is not only not needed, but is indeed in opposition to that artistic taste which should be acquired by those in search of pictorial results. A pinhole picture, omitting, as it does, the majority of the smaller details and blending them into their surroundings, leaves room for the imagination.

It must not, however, be supposed that I infer that the lens is of no use in pictorial work; in some cases it is a necessary piece of apparatus. But there are many subjects and occasions where the pinhole has great advantages over the lens. These advantages may be summed up as follows:

- (1) Any desired focal length (*i.e.*, no focus), and practically unlimited angle of view;
- (2) Perfect perspective and truthfulness;
- (3) Equal definition over any sized plate; and
- (4) Amount of halation reduced to a minimum.
- (5) No curvature of field; no distortion; infinite depth of field; no astigmatism; perfect equality of illumination.

The following would be an ideal lens:—No focus; infinite rapidity; infinite depth; infinite covering power; no distortion; perfect illumination; perfectly flat field; perfect sharpness.

## (1) Focal Length.

For any given lens there is only one distance from the plate at which it can be used. With the pinhole this is not so; it can be used at any distance from the plate, and at whatever distance used is equal to a lens of the focal length of that particular distance. There is no need to think about focussing, except so far as it effects the inclusiveness of the picture. If the pinhole be brought nearer to or further away from the plate so the angle of view

will be wider or narrower. It follows, therefore, that the angle of view is practically unlimited.

## (2) Perspective and Truthfulness.

With a lens the rays of light are collected (bent) and transmitted to the sensitive plate, and no lens has yet been made which will give an image so absolutely free from distortion as will the pinhole. The light-image passing through the pinhole is rectigraphic, and all objects are therefore rendered with geometrical accuracy. To obtain equal sharpness all over a plate with a lens, when photographing near and distant objects at the one time, we must stop down our lens to such an extent as to completely do away with perspective. With the pinhole, however, both near and distant objects are equally distinct (or indistinct, if you like), and the perspective is perfect.

## (3) Definition.

No image formed by a pinhole is as critically sharp as with a good lens, but all parts of the picture are equally defined, no matter what the angle of view or the size of the plate. That is to say, the covering power of the pinhole is *unlimited*.

## (4) Halation.

The amount of halation (*i.e.*, fog caused by reflection from the back of the plate) is so small that it may be considered to be practically non-existent. I have taken a photograph looking through a window towards a landscape in bright sunlight, and halation was not noticeable. Halation must not be confused with fog-veiling, which will be mentioned later, and which is peculiar to pinhole work.

## Disadvantages.

There are two, and only two, disadvantages in using a pinhole in place of a lens:—

- (1) The long exposure necessary.
- (2) The lack of critical definition which is necessary in some branches of photographic work.

But, taking all things into consideration, the advantages (in pictorial work, at any rate) quite overbalance the disadvantages.

## CAMERA.

Some treatises on pinhole photography recommend the making of a rough camera out of a cigar-box; but, if real work is to be done, it is better to use an ordinary stand camera with long extending bellows. A rising front may be useful, and is in some cases essential, and a swing back is most necessary when the camera has to be tilted to take in tall objects.

To the front board of the camera the pinhole plate can be easily fixed; or, if a Thornton-Pickard shutter is part of the outfit, the pinhole plate can be fitted to a spare panel. The latter arrangement is far handier, because the lens and pinhole can be quickly interchanged. After the pinhole-plate is made (according to directions given later) it may be fastened at the back of the shutter panel, in the centre of which a hole a quarter of an inch in diameter has been bored.

## Size of Pinhole.

Each sized pinhole has its best distance for giving the best definition. These sizes vary from 1-25in. to 1-70in. But for all practical purposes a medium-sized pinhole

will do all that is required for most work. I use 1-38in. myself, and the illustrations previously printed were made with this size. I would therefore recommend my readers to use the same, and have consequently made out a rough guide to exposure to suit this size.

## To Make Pinhole.

Obtain a sheet of ferrotype plate, and cut out a square of one inch. Lay this on a piece of soft wood. In the centre press firmly with the pointed end of a penhandle so as to make a dome on the lower side of the plate. Then, on an oilstone, rub this dome down until the metal is very thin, and pierce with a small-sized needle (say a No. 16 Millward Sharp). If the hole be examined through a magnifying glass, it will be found to have a burr on its edge. Rub on the stone to remove the burr, and then pierce again with a larger needle (say a No. 12), revolving the needle to make the hole perfectly round. Rub again on the stone to remove any burr, and pierce with a No. 7 needle (which is practically 1-38in. in diameter), and examine once more with the magnifying glass. If any burr is still left remove it carefully, and then blacken the edges of the hole over burning sulphur. Any sort of a hole will take some sort of a picture, but the more perfect the hole the better the result will be. With very little practice an almost perfect hole can be made.

Or, pinholes may be purchased. The best are those known as the "Watkins-Power." In getting one of these choose a W.P. No. 6, or a set (on a revolving disc) with four sizes of hole, and a larger hole for view finding. This larger hole may be useful for portraiture.

## Finding View.

As we do not know what angle of view we shall include in our picture, we cannot use any commercial form of view-finder; so we must resort to other means. I have found the simplest plan to be as follows:—

After selecting the view and setting up the camera, remove the ground glass and turn the camera round on its axis so that the back of the camera is towards the selected view. Put the eye close to the pinhole and look through, when the view will be seen included in the square originally occupied by the ground glass. Now rack the camera-front (which carries the pinhole) in or out, as it is required to include more or less picture. Having arranged the view satisfactorily, look along the top of one edge of the camera and note some object in line with this. Now turn the camera round so that the pinhole is towards the view, and be sure that the same object is in a line with the corresponding edge of the camera. Be careful, however, about two things:—

- (a) When the camera is first reversed, if it is required to include more or less foreground, it must be remembered that the front carrying the pinhole must be raised to include more sky, and lowered to include more foreground.
- (b) If the camera has to be tilted to include some high object, the swing back must be put vertical *after* the camera has been reversed the second time.

(To be continued.)