

these colours; more so when they are in a dry state. Therefore it is necessary to exclude from the dark-room all light except red or red and yellow mixed. Ordinary commercial ruby glass will not do; buy special glass from a photographic dealer. If a special room can be set apart, so much the better; in any case we must, if working in daylight, block the light coming through all windows and chinks in the doors, even the key-hole. At night time the bathroom is perfectly safe, unless the light happens to shine through the window from the next house or from a street lamp, in which case the rays of light must be stopped. A good water supply is a great convenience.

#### Negative Making.

It is necessary first to explain what a negative is. It is a glass plate, or film, coated with a sensitive gelatinous emulsion which has been more or less affected by the light coming through the lens, and which has been treated (developed and fixed) with certain chemicals. All the light parts in the original view are the dark

two plates each. Take the dark-slides and box of plates into the dark-room, and make sure that no light is coming from outside the room. Then light the ruby lamp and place it on some convenient shelf or bracket. Open the box of plates. *Do not go too near the light.* The plates will be found to be packed in fours; the two outside plates of each four with glass sides outwards, the two inner plates with the emulsion sides outwards and the glass sides in contact. Into each side of the dark-slide put one plate, *emulsion side outwards, i.e., towards where the lens will be.* Before putting the plates into the slides it is well to give them each a sharp knock edgeways on a table or the hand, so as to remove any dust. *Do not brush the film, and do not touch the emulsion side with the fingers;* catch the plates by their edges. Having filled the dark-slides, be careful to close the box of plates and put out the light. Wrap the dark-slides in a cloth.

#### Direction 2—Taking the Photograph.

We are now ready for exposing a couple

camera should always be level from side to side. Having arranged the view to your satisfaction on the ground glass, be sure that all clamps and screws are tight, and *do not forget to set the shutter (or put the cap on the lens).*

#### Method in Focussing.

First make up your mind as to what is the principal object in the picture chosen. It may be a tree, the cloud effect, a building, or it may be the general effect of light and shade. But there must, in every scene, be some special feature which predominates, and it is necessary to find out what this is before focussing can be properly done. A good way to ascertain what this special feature is, is to close the eyes for a few seconds, then open them for one-fifth of a second only, and try to think what you saw most of. Perhaps the whole scene you will think! Try again, and again, and in time you will find that some object will engage your attention more than the other. This will be the object of principal interest, and must be in the sharpest focus (*i.e., sharper than any other object*

in the picture) but not necessarily microscopically defined. We will suppose that the principal object is a tree, twenty feet away; near at hand are bushes, and, in the distance, hills. Use the largest stop you have (say F. 8), and bring the tree into the focus desired. Now stop the lens down to F. 11, and focus again in such a way as to render less sharply the distant hills, but at the same time retaining the desired degree of sharpness in the tree. Now turn your attention to the bushes in the foreground. Probably you must use a still smaller stop, and again adjust the focussing so as to retain the tree just as sharp as you wish, the distant hills less sharply defined, and at the same time get the foreground bushes sufficiently sharp so that the eye may see them and know quite well what they are without being specially attracted to them.

The guiding principle should be to put the principal object in sharpest focus, and other objects in subordinate degrees of definition according to their pictorial importance. It must be remembered, however, that the colours of nature are apt to mislead even experienced workers at times. The small scale image as seen on the ground-glass is often such a charming object that for a moment we may fail to remember that our print will be robbed of its colour charm. It is an excellent plan to have a dark blue glass to slip on the lens. This will in general serve as a reminder as to our ordinary monochrome rendering.

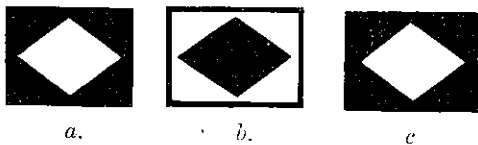
(To be continued.)

Writing approximately, there are 147,500 miles of highways in England and Wales, of which 118,000 may be regarded as district roads. There are 29,500 miles of main roads, 23,500 being in the rural districts and the remainder in urban districts. Of these latter a considerable stretch have been treated with preparations to ameliorate the dust nuisance; Mr. R. Brown, the surveyor to the Southall District Council, estimates that probably one-third of the total mileage has already been dealt with. This leaves about 4,000 yet to be reconstructed at a cost of over three-quarters of a million sterling.



TAKEN WITH  $\frac{1}{32}$  IN. PINHOLE AT 16 INS. FROM PLATE. EXPOSURE 25 MINUTES.

parts in the negative, and *vice versa*. Suppose the following diagram (a) were photographed:—



The dark parts photographing light, and the light parts photographing dark, would form the reverse, or negative (b); and on taking a print this would be again reversed and form the positive (c), similar to the original (a). If some of the dark parts of the original were not so dark as others, they would photograph darker on the negative, and consequently would appear lighter on the print.

A finished negative is no longer sensitive to light, and with careful handling thousands of prints may be taken from it.

#### Direction 1—Filling Dark Slides.

(NOTE—The following directions apply to all sizes of plates, but I am at present assuming that we are using quarter-plate.)

Most dark-slides, or plate-holders, carry

of plates. Choose some simple view on a bright day between 9 a.m. and 4 p.m. *Do not face the sun.* Set the camera up so that the base-board is perfectly level, so that the camera is not tilted either towards the sky or the ground. The lens should be open, *i.e.,* as large an opening in the lens as possible. Put the focussing cloth over the head and examine the ground glass where the image will be found, upside down. It will probably be blurred and indistinct. Rack the lens nearer to or further away from the ground glass until an object at, say, 20 feet distance, is quite distinct. This is called "focussing." If all that is required in the picture is now included on the ground glass, proceed as in Direction 3. If not, move the camera backwards or forwards, as it is wished to include more or less view. If it is found that the camera has to be tilted to get in a tall tree or building, the ground glass focussing screen (*i.e.,* the back of the camera) must be put vertical. But, if the lens be a good one, it is better to keep the camera level when possible, and to raise the lens to take in high objects. The