

## Photographic Notes

Beautiful photographs of the bottom of the Mediterranean have been taken by a Frenchman, who uses a barrel of oxygen surmounted by a glass globe containing an alcohol lamp, a mechanical contrivance throwing magnesium powder on the flame when a view is to be taken.

**SEPARATING FILMS FROM THEIR SUPPORT AND ENLARGING SAME.**—According to a British patent, just published, this may be done by preparing the following solution :

Fluoride of sodium ..... 1 dram.  
Citric acid..... .9 drams.  
Water..... .7 ounces.

The negative is allowed to remain in this until the film separates from the support, and it is then removed to a bath of cold water, where it remains until the desired enlargement is effected. The above formula will enlarge the film two times. For a greater enlargement, use more of the acid : for a smaller, use less.—*Photo Beacon.*

**TOURISTS' DEVELOPERS.** During the holiday season, when amateurs are on tour or tramp, they frequently desire a dry powder developer to carry with them, which they can dissolve in water to develop just one plate as a test of their exposures. A very convenient formula is the following :

Hydroquinone..... 15 grs.  
Eikonogen..... 7½ grs.  
Sodium sulphite..... 60 grs.  
Potassium bromide..... .2 grs.

Powder the ingredients and wrap in white demy, waxed paper, and tinfoil. In another paper wrap up—

Lithium carbonate..... 20 grs.

Directions for use: Dissolve the contents of these two packets in 4 ozs. of water to make a developer suitable for all ordinary work.

The hydroquinone and eikonogen in above formula may be replaced by 20 grains of pyrogallic acid, and 2 grains of oxalic acid ; but this does not keep so well as the other.

Instead of packing the powders in paper, the small flat bottles, such as used for tablets, may be used for the actual developing powder, the lithium carbonate keeping very well in paper.—*Pharmaceutical Journal.*

### Photography for Chemists.

**EXPOSURE AND DEVELOPMENT.**—After exposing a plate, the all-important operation of development has to be undertaken, and to successfully develop a properly exposed negative is at once a science and an art. To attempt to give a practical lesson in development on paper is a task from which we shrink, but we can lay down certain fundamental methods, fol-

lowing which error will not be so frequent nor failure so depressing, but we may at once state that one hour's practical lesson is worth a hundred articles, provided, of course, you see a good operator at work.

We must first of all suppose a simple subject, such as the view over some gardens from our back windows. If we have one dark slide, then both sides would be filled with slow or landscape plates. If we have more slides, then fill them all, and having set up the camera, let us consider for a moment what exposure we intend to give. We will stop our lens down to  $f/32$ , and assume that we have chosen between 12 and 2 as the time for exposure.

Having focussed and stopped the lens down, put on the cap, turn back the focussing glass and insert the dark slide, taking care not to shift the camera ; if the dark slide goes in too stiffly, rub the edges with ordinary black lead and polish with a dirty duster. Now cover the camera and dark slide with the focussing cloth, insert the hand under the cloth, take hold of the projecting tongue of dark slide shutter, and gently withdraw. Be careful always to work in one particular way: first focus, stop down the lens, cap it, insert slide, withdraw shutter ; by doing this failure is avoided.

We know nothing of the exposure required, so intend to make some experiments and determine, having four plates to give exposures in geometrical progression, starting with half second ; therefore, we shall give half, one, two, and four seconds.

Now for timing exposures. The simplest way is to start with the fingers on the cap, gently ease it to the edge of the hood and smartly, yet without force, remove the cap and start instantly 0 1 2 3 4, 2 2 3 4, 3 2 3 4, 4 2 3 4, thus counting four to each second, and always starting a fresh second with the number which, when the second is complete, will be the number counted. A little practice against a watch with a seconds hand, or against a pendulum clock, or even a bunch of keys hung to the end of a stout string about 9 inches long, which, of course, beats half seconds, will soon make this very simple and easy, and from considerable practice our error in seconds counting does not reach 2 per cent.

We expose our plates then for the above-stated times and enter the darkroom, ready to develop. We determine to use pyrogallol with the fixed alkalies, not ammonia, and for preference decide on soda ; the recrystallized sodium carbonate should be used in 10 per cent. solution. We also want a 10 per cent. solution of potassium bromide and pyro. ; formulae for these have already been given.

A normal developer, that is, one which may be used for all plates without fear of fog, assuming them to be rightly exposed, is as follows :

Pyro..... 2 grs.  
Potassium bromide..... ¼ "  
Sodium carbonate..... 12 "  
Water to make..... 1 ounce

Mix this in a measure, allowing 1 oz. for quarter plate, 2 ozs. for half plate, and 4 ozs. for whole plate. This is to old workers rather too much, but for beginners it is better to waste a little developer than waste a plate. Open the dark slide, not right in front of the light, but in the shadow. Remember that the side which faced the lens was, or should have been, the film. Place the plate this side up in the dish, take the dish in the left hand, slope it with one side and end away from you, slightly, not too much ; then take the measure, lower it at the higher end on to the dish edge, and with a sudden sweep, drawing the measure down the side of the dish away from you, pour the developer over the plate, and immediately rock the dish backwards and forwards, and put down the measure. Now raise the dish a little, lower the head, and hold the dish up towards the light and examine for air bells, which will be seen by the shadows they cast, or by the little waves they cause when the dish is gently rocked. If any are visible they may be removed by using a very soft, long-haired, flat camel's-hair brush, this being gently passed over the surface of the plate backwards and forwards. Some careful operators always use a brush, others, quite as careful, use their fingers. If a brush: be used it must be kept for this work only ; have a special nail to hang on, and a very stout india-rubber ring, such as are used for soda-water bottles, slipped up the handle to prevent the hairs touching any wall or surface.

It is always advisable to note the time of pouring on the developer, and for this purpose a watch or clock with seconds hands may be used ; or Watkins' eikronometer, a specially-devised clock, to be obtained wholesale from R. Field & Co., Suffolk street, Birmingham, can be bought, price 10s. 6d. The idea in noting the time of pouring on the developer is that we may determine the duration of development ; for upon this depends the quality of the negative.

We will first of all take the plate exposed for half a second and, having poured on the developer, eagerly watch for any signs of an image, carefully rocking the dish meanwhile. Time passes, and after seventy-five seconds there is a faint trace of the sky just showing a delicate tinge of gray on the creamy ground ; and now we see signs of one or two more bright objects, or, as we call them, "high lights," the bulk of the image ; however, all the trees, the parts in shadow, remain unaltered. After two and a half minutes, as the sky is getting darker and darker, and here and there a few scattered points show up, the question arises, have we under-exposed ? Probably so ; therefore, we measure out 6 grains of sodium carbonate (= 1 drachm 10 per cent. solution) in the measure, pour the developer from the dish into the measure, and return the mixture to the plate and rock ; a little more appears, and after about thirty seconds more we add