answers very well, and is by many operators preferred to bank posts; it gives a smoother and brighter surface than the latter, but, being softer, it does not stand washing so well.

Sensitizing.—The standard formula for the preparation of the sensitizing coating is—

Gelatine	3	parts
Bichromate of potash...	2	,,
Water	50	,,

The gelatine is soaked in the water till soft, and then dissolved with heat, the bichromate in powder is added and stirred till dissolved; or the gelatine may be dissolved in half the quantity of hot water, and the bichromate in the other, and the two solutions mixed.

The proportions will depend upon the quality of the gelatine and the prevailing conditions of temperature and humidity of the atmosphere. More of a soft gelatine than of a hard will be required, and in hot weather it will be advisable to mix in a proportion of strong gelatine and increase the quantity to five parts, while the bichromate may be reduced to one part. The addition of a small quantity of liquor ammmonia will also probably be an advantage in enabling the paper to be kept longer in good order, but we have not found it necessary.

The above solution is strained through one or two folds of cotton or woollen cloth into a dish or trough, which should be placed in another containing hot water.

For sensitizing large sheets we use a copper trough about eight inches wide, two inches deep, and long enough to take the width of the largest sheet to be sensitized. This trough stands in an outer one of the same metal, rather larger every way, and supported on legs about ten inches high; so that, if necessary, a lamp or small stove may be placed below to heat the water contained in the trough and keep the gelatine solution liquid.

The surface of the solution having been skimmed to clear it of froth and bubbles, the paper is passed over the surface of the liquid gelatine, so as to obtain an even coating free from air-bubbles, and is then drained and hung up to dry in a dark place free from dust.

When large quantities of paper have to be constantly prepared, it is convenient to have a drying-box which may be made of galvanised sheet iron fastened on a wooden framework and heated from below with gas, oil, or charcoal, a vent being made above to cause a current of air, and give exit to the damp vapour.

Fixed at each side of the box are one or two wooden cross-pieces, with notches at about six inches apart, to receive the thin wooden slips, on which the sensitized paper is fastened with clips or pins. The lower series of notches must come between the upper ones, so that the drippings from the upper sheets may fall clear of the lower ones. The wooden slips may be varnished and greased with cocoa butter, or other suitable material, as recommended in the Autotype Manual for sensitising carbon tissue, but we have not found it necessary.

As soon as the first coating in dry, a second is given in the same way; but in hanging up the paper the second time, that end should be uppermost which was lowest before, so as to as far as possible equalise the coating.

Before use, the paper should be glazed by passing it through a lithographic or copper-plate press in contact with a plate of polished metal. The press and zinc plate or stone which serve for inking the transfer prints will answer perfectly for this also. The glazing is of importance, and adds very much to the sharpness and delicacy of the lines.

The prepared paper should be of a fine, bright, even yellow colour, and free from streaks of uneven coating, bubbles, or spots of dust and dirt. The coating of gelatine should not be too thick, or the finer lines will be apt to wash away, while the strong lines will have a tendency to absorb too much moisture in damping and spread out in transfer. In the inking-up methods, too thick a coating of gelatine will swell too much, and be difficult to ink. If, on the other hand, the gelatine coating be too thin, when inking in the press the ink may be forced into the substance of the paper, staining the ground and making it difficult to get clean transfers. A moderate thickness gives the best results by either method.

The sensitized paper will, under favourable circumstances of dry cool weather, keep good for a week or longer—we have known it keep good for a month; but in hot damp weather, such as is experienced in the hot and rainy seasons in some parts of India, it will not keep for more than a day, and must be used as soon as made. When circumstances permit, it is preferable not to use it quite fresh, but a day or two old.

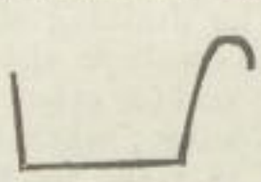
In using this paper in the usual washing-off method, the whole of the unaltered gelatine should dissolve away and leave the paper perfectly clear of gelatine except in the lines under the ink. This entire removal of the gelatine has, however, been objected to by many operators as not giving the necessary "grip" in the process of transfer on stone, though I have not observed that this defect causes any difficulty on either grained or polished zinc.

It has therefore become the more general practice to use a paper prepared so that a coating of insoluble colloid may remain on the surface after development of the transfer print.

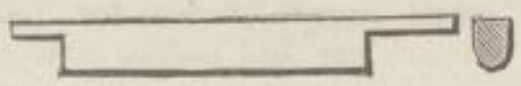
The first method of this kind was that published by Mr. J. W. Osborne, of Melbourne, in 1859, a little earlier than the Southampton method, and it is, I believe, still used with admirable results in the Australian Colonies.

I am indebted to Mr. Fraser S. Crawford, of the Surveyor-General's Office, Adelaide, for the following particulars of the preparation of the photo-transfer paper according to Osborne's method.

1,600 grains of Nelson's opaque gelatine are dissolved in 10 ounces of water, and 880 grains of bichromate of potash also in 10 ounces of water. The two solutions are mixed, and when cooled to 90° F., 4 ounces of albumen are added, and the mixture strained through fine muslin into a tin trough 18 inches long, 3 inches wide, and 1½ deep, one side being bent round as shown in the figure.

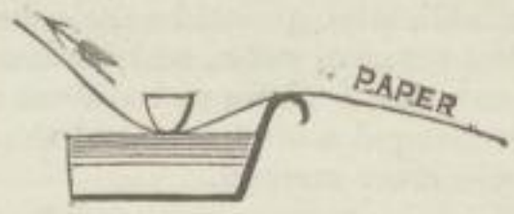


Section of Trough.



Wooden Scraper.

The paper used is Rive's thin photographic paper, and the manner of coating is as follows:—The operator takes a sheet of paper by two adjacent corners, and holds it over the trough while an assistant presses it down into contact with the surface of the liquid with a wooden scraper; the operator then draws the paper slowly towards him (see figure), the surplus solution is drained off for a few seconds,



and the sheet hung up to dry, and, when dry, is passed under the press on a clean stone to smooth the surface.

Mr. Osborne particularly recommends this mode of coating paper as economical, ensuring regularity of coating, and enabling the liquid to be retained at the desired temperature without difficulty. He also lays great stress on the freshness of the albumen, the object of which is to become coagulated by the treatment of the transfers after inking with boiling water. This layer of coagulated albumen is the distinguishing feature of his method, in-