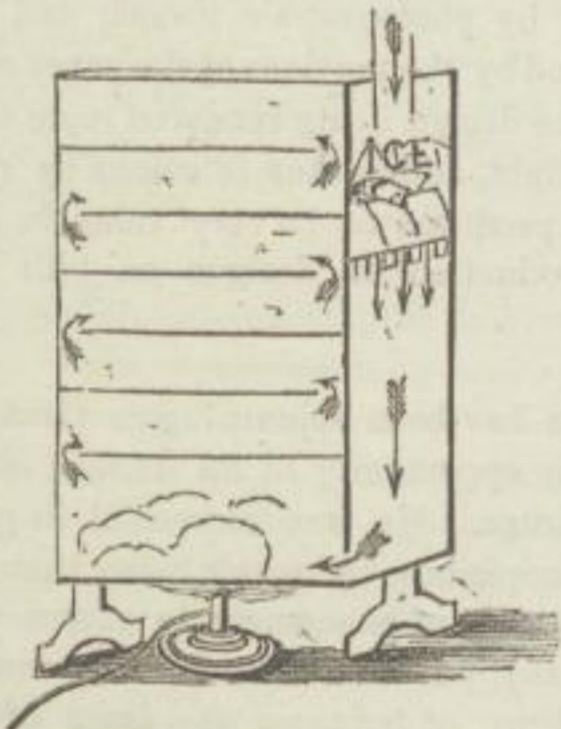


American eye. I have actually seen people in Glasgow going into a photographer's to "get taken" on a day when the light was such that an American photographer would have shut up shop. But to revert to my subject, we enjoy plenty of sunlight; and though that tends to make us rather slow in the use of dry plates, it is a great assistance to commercial photography, so that in New York alone the number of firms engaged in my third or typographic class may be counted by dozens. The photo-lithographers are also numerous, and one large daily newspaper has been illustrated by this method for some years. It is, if I am not mistaken, the only illustrated daily newspaper in the world. In the third, or typographic class, to which I now refer, two methods are commonly in vogue—first, the zincotype class, which simply depends on photography for the image, and upon the action of a corrodent for the relief; and second, those which, like the gelatinotype, depend for relief upon either the swelling or dissolution of a sensitized film of gelatine or gum. In the zincotype and the swelled gelatinotype the negative is of the ordinary opaque description, such as is made use of in photo-lithography, and is usually intensified with lead or copper. In the case of the dissolved gelatinotype, the negative that is used must be a reversible film, which is made in this way: the glass is very thinly albumenized, and after the negative is obtained and dried, it is treated to a coat of india-rubber dissolved in sulphuric ether; this is, when dry, coated with collodion; the glass is then immersed in water or dilute acetic acid, the impressed film comes away quite easily, is quite strong, and can thus be readily reversed; and after use, instead of being scraped into the cleaning trough, it is taken off its support, and put away for further reference.

Zincotyping, as commonly practised, consists in transferring an inky image to a suitable piece of metal by the well-known photo-lithographic method. This transfer is dusted with resin flour, which serves the double purpose of further protecting it from the encroachment of the corrodent, and also of protecting the sides of the slightly etched lines from undermining from the same cause. This is done, after the first application of the acid, by slightly warming the plate, which causes the resin to melt and run down on the sides of the lines, which are thus shielded from the subsequent applications of the corroding agent. I may say that the zincotype has given way to the gelatinotype almost universally; and I will close with the three most usual forms of the latter process, the first and second depending on the expansion of portions of the film, the third upon its melting or dissolution.

The chief difficulty with us is drying the film in our hot summer weather, and to this end a dryer has been invented, which is used with universal success. The dryer is similar to the ordinary dry-plate cupboard with shelves arranged so that the air passes from side to side over each shelf in succession; the air being admitted through a zinc-lined chamber attached to one side,



which in its upper part contains ice. From this chamber the air falls on the bottom of the dryer, which is a metal plate, beneath which a Bunsen-burner is arranged. The exit pipe at the top is conveyed into a chimney. To return to the swelled gelatinotype No. 1. An ordinary glass is coated with the sensitized solution of gelatine, giving a film the thickness of a very thin card; this is printed under a negative, which is carefully masked to prevent over-printing in the shadows. When printed, the plate is immersed in a solution of tannin or alum, where it remains till the unprinted portions are sufficiently swelled; the

printed film, of course, retaining its normal condition and thickness, assumes the appearance of small but regular depressions all over the surface of the plate. A wax cast is taken from this, which in turn gives the matrix for the stereotype.

In the second swelled gelatine method any thin sheet metal is used instead of glass; but the metal must be protected from the action of the bichromate, else the plate will soon become corroded and useless. The plate, after printing in a screw-back frame, is placed in a chrome alum bath, and when sufficiently raised, is cast direct in plaster, and electrotyped, which makes the process somewhat shorter than the foregoing one. The last gelatine method, or dissolving process, is done in this way:—The melted solution is poured into large plate-glass trays with a raised lip or edge; these trays have previously been flowed with a thin solution of bees-wax in ether to prevent the film, which is nearly one-sixteenth of an inch in thickness, from adhering to them. They are then levelled up in the dryer, and, when chilled, are placed face downward until dry, when the large sheets of gelatine are easily stripped from the trays. With a pair of shears a piece of the size wanted is cut off these sheets and placed under the negative in an ordinary frame; after a short exposure it is taken into the dark room temporarily fastened to a glass with shellac; an ordinary brush, such as is used by silversmiths, is then immersed in warm water and rubbed over its surface; the unprinted portions dissolve at once, leaving the printed parts intact. When sufficiently dissolved, the plate is placed in alcohol for a few seconds to free it from water, and is then dried, when it is ready for the electrotyper at once. A word upon the intractability of gelatine films of appreciable thickness may not be out of place. The addition of glycerine hardly helps matters much, as in the swelled gelatine process we find that, when sufficient glycerine has been added to prevent the cracking of the film, the entire film after soaking becomes flaccid and easily displaced.

The peculiar way in which gelatine films will crack off the plates, flying into numberless pieces, frequently taking the glass with them, is annoying, to say the least; and I find that even here the phenomenon is not unknown. I have seen a piece of plate-glass three-quarters of an inch thick coated with a film hardly thicker than this paper, which, when subjected to a change of temperature, cracked with a sound like tearing strong cloth. Upon examination the surface of the glass in places was found torn out to the depth of one-eighth of an inch, and adhering to the gelatine fragments which strewed the floor. A mere accident led to the discovery of a remedy. An experimenter having mixed up his gelatine to soak, was suddenly called away; at the end of three days he returned, and was assailed by the odour which greeted him from his gelatine, which had taken advantage of his absence to decomposing thoroughly. He was about to throw it away, when the idea struck him that perhaps it might act differently from ordinary gelatine; so he cooked it, made up his plates, and after testing them in every possible way, found they would neither crack off, swell off, bubble, frill, nor act in any of the inconvenient ways with which gelatine workers used to be so familiar, and perhaps are not entirely free from yet.

Notes.

The expeditions equipped to observe the great solar eclipse in May next are on the eve of starting. English, French, Italian, and American observers will all gravitate towards the same spot in the Pacific, a tiny desert island of the Carolina group, not very far from Pitcairn Island, of which we have heard so much lately. As we have said, the eclipse will here last nearly six minutes, so that there will be plenty of time to secure photographs of those wonderful phenomena around the sun which are seen to such advantage when the fiery orb itself is blotted out. But our scientific friends will have to undertake an ocean trip of three months to enjoy their six minutes.

The English expedition is to join that from America at Panama, whence both parties proceed together to