

THE PHOTOGRAPHIC NEWS.

Vol. VII. No. 227.—January 9, 1863.

PHOTOZINCOGRAPHY.*

THE work of Col. James and Captain Scott, on photozincography, is one of the most interesting books which have been published in connection with the art, not simply as a complete and detailed statement of the processes and formulæ used at Southampton, but for the variety of fine reproductions in printer's ink with which it is illustrated.

Referring to the latter first, we are enabled to endorse the opening remark in Col. James's introduction, as to the high state of perfection to which these processes have been brought at Southampton. For reproduction of engravings and similar subjects, we have before said, that both the process of Col. James and that of Mr. Osborne have reached a pitch of excellence which leaves little to attain or desire. Amongst the dozen photographic illustrations given in this book are exquisite copies of engravings, some of which have a great deal of fine, close work, which is most perfectly rendered. We may mention amongst these a reduced copy of a fine engraving from a painting by Raffaele; two of Piranesi's engravings of antique vases of rare design; and a reduced copy of one of Volpato's engravings of a panel in the Vatican, painted by Raffaele. There are also fine specimens of hill shading, and fine detail in maps; a reduced copy of an indenture; a page of Domesday Book; and a page of the folio edition of Shakespeare of 1623. Each of these are perfect illustrations of the value of the art for the several kinds of work represented.

The technical details of the work will be read with much interest and attention amongst photographers. The processes are divided for clearness into three parts. These consist in the production of the negative; the preparation of the positive photographic print in greasy ink; and the transference of the print to the surface of the zinc, or to stone, and the preparation of that surface for printing. These processes are here more fully described than in any previous work, and a brief *résumé* will doubtless be interesting to our readers.

It must always be borne in mind, that the negative most suitable for giving good results on the lithographic stone, is one perfectly dense in the whites of the picture, and quite clear and transparent in the blacks; in short, great brilliancy, intensity, and freedom from any trace of foggy deposit on the shadows, and as in engravings, maps, &c., the gradation is secured by the artificial means of lines, hatching, or stippling, the gradation known by photographers as half tone, is not required in the pictures.

The collodion used is simply iodized, and is preferred about a fortnight old. The formula given stands as follows:—

| | | | | |
|---------------------|-----|-----|-----|-----------|
| Pyroxyline | ... | ... | ... | 80 grains |
| Iodide of cadmium | ... | ... | ... | 15 " |
| Iodide of potassium | ... | ... | ... | 75 " |
| Alcohol sp. gr. 812 | ... | ... | ... | 10 ounces |
| Ether sp. gr. 725 | ... | ... | ... | 10 " |

The usual silver bath of from 35 to 40 grains to the ounce of water is used, slightly acid with nitric acid, in preference to acetic acid.

The development is effected by iron. The formula stands thus:—

| | | | | |
|-----------------------|-----|-----|-----|-----------|
| Protosulphate of Iron | ... | ... | ... | 1 ounce |
| Glacial Acetic Acid | ... | ... | ... | 6 drachms |
| Alcohol | ... | ... | ... | 6 " |
| Distilled Water | ... | ... | ... | 1 pint. |

The image is sufficiently developed by means of this solution, especial care being taken to stop its action before there is the slightest trace of deposit on the fine lines or shadows. Further intensity is then secured by the application, after fixing, of pyrogallic acid, a grain and a half to the ounce, twenty-four minims of acetic acid, and a few drops of a solution of silver. If further intensity be required the negative is immersed in a weak solution of bichloride of mercury until its surface is whitened; it is then treated with a weak solution of hydrosulphate of ammonia, which gives the required density. To prevent lateral deposit filling up the fine lines, the last process of intensifying is effected after the plate has been suffered to dry, the edges being varnished to prevent the film slipping.

The apparatus used for convenient copying was fully described in the PHOTOGRAPHIC NEWS, Vol. III., and we do not find that any material alteration has been made except in the adoption of Dallmeyer's triple achromatic lens for copying.

To produce the transfer the paper must be hard, thin, and tough, of even texture, and free from woolliness, and but slightly sized. Paper made from linen is most suitable; the best results have been obtained with the ordinary bank post paper, slightly sized. The proportions of the bichromate and gelatine—gum has long been abandoned—vary with circumstances. It is necessary that the solution of gelatine be fluid at a temperature of 100°, and that the proportion of bichromate be sufficient to render the whole of the gelatine insoluble under the action of light, but no more. The quantities here stated are two ounces and a half of bichromate of potash dissolved in ten ounces of hot water, added to three ounces of gelatine, dissolved in forty ounces of hot water. The fluidity is maintained by placing the dish containing the mixture in another containing hot water. The paper is floated for a few minutes, and when dried, the process is repeated. When again dry it is passed through a copper-plate press, on a hot steel plate.

The time of exposure to the negative varies, from one minute in the sun, to twenty minutes in dull light. When sufficiently exposed, the blacks appear of a brownish green.

The transfer ink, is made as follows:—two pounds of chalk lithographic ink, and one pound of middle linseed oil varnish are ground together; four ounces of Burgundy pitch are melted in an iron vessel, and to it are added two ounces of palm oil, and two ounces of white wax; these are well stirred together on the fire until they begin to burn. The ink and varnish, first mixed, are then added, and the whole thoroughly incorporated.

For use, a portion of this is thinned with turpentine to the consistency of thick treacle. To apply this ink to the surface of the print, a zinc plate or lithographic stone is inked in the usual method with a roller; the bichromate print is then laid face down, and passed through a lithographic press. By this means the whole of the surface is covered with a uniform surface of ink.

To remove the ink from every part but the image, the print is floated for five minutes on water at 90° Fah. back

* On Photozincography and other photographic processes employed at the Ordnance Survey Office, Southampton. By Captain A. De C. Scott, R.E., under the direction of Col. Sir Henry James, R.E., F.R.S., &c. London: Longman & Co.