

APPENDIX

OTHER PIGMENT PROCESSES

The term "Pigment Processes" is usually held to cover, in Continental publications, not only the processes in which fatty inks are applied to differentially swollen matrices, but also such other processes as carbon, gum, etc. Here, however, we intend to restrict ourselves to those processes usually covered by the term in England, i.e. the fatty ink processes.

The Oil Process. It is usual to give a description of this simpler ancestor of the bromoil process in all treatises on the more vigorous descendant, but we do not need to go into great detail here, as the method is almost obsolete, owing to the necessity for enlarged negatives in most cases, if a reasonable size of print is to be obtained. A gelatine-coated base paper, such as the Autotype oil printing paper, or a double transfer paper, as used in the Carbon process, is sensitized by immersion in 5-10% ammonium bichromate solution or a similar alkali bichromate, is dried in the dark, preferably squeegeed to a ferrotype plate to eliminate draining marks, and is then exposed to daylight under a negative of soft contrasts. The image prints out in a greenish brown tinge, and printing should be continued until detail is visible in the highlights. The paper is then washed free from bichromate immediately (the printing action continues on keeping), and the matrix may be inked up after swelling as for a bromoil. 60°-70° F. are suitable swelling temperatures for Sinclair's Encre Machine in most cases. The results may, of course, be transferred, and, in fact, generally transfer more readily than bromoils. Demachy, and more recently, Leonard Misonne, are well known workers in the simpler process.

Starch Oil. The oil process may be carried out substituting starch for the gelatine of the normal process. This entails coating the paper at home, but against this, the quality of the prints is less greasy and more reminiscent of a transfer.

The coating solution may consist of 7 gms. of starch made into a paste with 30 cc. of water, and diluted with 240 cc. of boiling water stirred in, the whole allowed to cool and 30 cc. of saturated ammonium bichromate added, subsequently straining. An unsized or partly sized paper such as Van Gelder should be used, and is given a preliminary saturation with ammonium bichromate solution. The actual starch coating is floated on after the edges of the paper have been turned up to form an impromptu dish. The excess is poured off after three or four minutes, and the paper dried in darkness. Swelling occurs in cold water, and a soft ink will usually be needed.

Carbro Oil. The Carbro procedure may be adapted to the fatty ink method of image production. Instead of carbon tissue a piece of oil printing paper is used. The ordinary Carbro baths are used as in the standard process, but after squeegeeing in contact with the bleached bromide print, the oil paper is stripped and is then ready for pigmentation after washing out the yellow stain. Preferably, however, it should be dried and re-swelled before pigmentation. Although prints by this method in some cases ink up with considerable ease, in others a very high relief is encountered which necessitates the use of a very thin ink, with the result that the image lacks depth. The Autotype Co. later advised an altered procedure, but this was difficult to carry out, and did not yield better results. The method, however, merits experimental investigation.

Bromoil Lithography. The use of a bromoil print to serve as a base for the preparation of a lithographic stone or plate, thus permitting of the multiplication of prints from the same original matrix, has been introduced by two workers, Fred Judge, and De Santeul. Fred Judge is mainly concerned with taking advantage of the unique quality possible by this method, while the other author is principally looking to the lithographic technique as

a means of securing considerable numbers of copies. There is little point in going into great detail with these processes here as it would not be easy for anyone not already acquainted with lithographic technique to work successfully in this difficult medium. Briefly Judge's process is as follows: The bromoil image inked with a mixture of bromoil and litho. inks is transferred to a litho. plate, preferably of zinc. The plate is treated with acetic acid, whirled and dried. A second transfer may be effected if the first is not powerful enough. The image is then worked up as usual in lithography by treatment with 40% gum arabic solution, drying, and re-gumming. Wash-out tincture is applied to remove the ink through the gum layer, the gum is washed off, the image inked up with a roller and pulled until sufficient strength is obtained. If a large edition is required it may be necessary to etch, and then repeat the gumming. The whole process is fully described in the *Amateur Photographer*, 1929, Feb. 13th, pp. 127-128, and Feb. 20th, pp. 150-151.

De Santeul's process relies on a grainy bromoil image which is transferred to a stone or plate. The image is strengthened with gum solution, and the bromoil must be inked with lithographic transfer ink thinned with turpentine. Etching of the litho. image is carried out with

(a) For stone

9 parts of 10% fresh gum solution
3 parts of 3% nitric acid

(b) For zinc

Water	.	.	.	.	1,000 ccs.
Gum arabic	.	.	.	.	100 gms.
Gallic acid	.	.	.	.	20 gms.
Phosphoric acid	.	.	.	.	10 gms.

The process is described in *Photographische Korrespondenz*, 1929, March, pp. 78-80.

FURTHER POSSIBILITIES FOR SIMPLIFIED BROMOIL

A field for simplifying bromoil technique which has not been worked on to the extent which its promise would indicate, is the production of differentially tanned images by development of the bromide print in a strongly tanning developing solution. A good number of references to such processes appear in the literature, and some developers which may be used include pyrogallol, hydroquinone, and adurol. A suitable pyrogallol formula is given by the Agfa Company in their English patent No. 172342 as:

Pyrogallol	.	.	.	.	2 parts
Sodium sulphite	.	.	.	.	1 part
Potassium carbonate	.	.	.	.	15 parts

Another formula from the same source is:

Pyrogallol	.	.	.	.	2 parts
Metol	.	.	.	.	0.2 part
Potassium carbonate	.	.	.	.	15 parts

After developing and fixing, all that is necessary is to bleach the silver image away, when the differentially tanned matrix is stated to be ready for inking with a fatty ink, or, alternatively, for dyeing up by imbibition; It certainly looks as if there is here a method for simplifying the production of matrices for bromoil. As the tanning occurs very early in the history of the gelatine, before it has been submitted to the action of many reagents, it might be possible to secure in this way an added degree of reproducibility, always remembering that development conditions would have to be standardized rigorously. If too much swelling were produced, it could probably be reduced by adding, say, sodium sulphate to the developer.

THE "OLEOBROM" PROCESS

This process which is being introduced by Messrs. Wellington & Ward, Ltd., is designed to give results very

similar to, if not identical in outward appearance with, those of the classical bromoil process, but with increased speed of operation, and increased certainty. Bromoil is a process which, if the instructions given in this book are followed, is capable of giving a very high percentage of successful results, but each print, involving as it does the personal element in a high degree, is likely to differ slightly from the next, according to the predilections of the worker while making it. The new process is much more in the nature of a purely photographic process, and reproducibility is of the same order as with bromide printing, while the possibilities of control are very nearly as great as in the standard process.

The success of the new method of working is dependent on the employment of the special solutions and inks devised, after an exhaustive research, on the standard bromoil process, and the extra reproducibility and speed of working depend entirely on this factor. As will be seen, the operations do not depart radically from those already described until the inking stage is reached.

The special "Oleobrom" bromide paper must be used for the silver prints, and the exposure must be so timed that a distinctly light grey print, full of detail all over, is obtained after $1\frac{1}{2}$ to 2 minutes' development in either amidol or M-Q developers. The paper is so manufactured that the requisite type of print is easy to get. After development the print is plunged into the special stop bath, and kept immersed in this for two minutes, when it is rinsed for two minutes, and bleached in the specially compounded bleaching bath. After this, it is again rinsed and fixed in 10% plain hypo, after which it is washed for thirty minutes, and dried. This, it will be seen, follows the abbreviated bromoil procedure, with the insertion of a stop bath instead of the washing out of developer with water.

In the inking, which is by means of rollers instead of brushes, greater divergences from the normal appear. Two or three portions of the special ink (available in a range of colours, which are all easily miscible) are squeezed out on to a large glass plate, and a specially ground rubber roller is rolled over the ink to give a uniformly spread patch. From this patch a second, more thinly coated,

is rolled up on the clean portion of the glass. The roller should be a little longer than the shorter side of the print.

The dry print is now taken and rolled up evenly with the inked roller, until covered with a thin film of ink. It is then taken and immersed in a bath of water at room temperature. After a few seconds, the image can be seen appearing faintly on the print. A clean roller is now taken and rolled firmly over the surface of the print under the water, whereupon a gradual removal of ink from the lights and a deposition on the shadows occurs, leaving the print in full detail, but distinctly under-inked in the middle tones and lights. At this stage it is removed from the water, and placed upon a cork pad, and carefully blotted surface-dry with a soft muslin, or other cloth. It is important to leave no superficial water.

The print is now rolled over gently with the original inked roller, when the full detail of the middle and lighter tones appears, and the shadows are deepened and made more brilliant. At this stage local removal and addition of ink may be carried out with small rollers, clean or inked as the case may be, or small stumps or pieces of wood-wool or other materials may be used. Even brushwork with ordinary bromoil brushes is easily possible. When all the necessary control has been exercised, the margins of the print may be cleaned up by rolling with a clean roller, or by rubbing with a clean damp cloth (the emulsion is so hardened in the manufacturing process that there is no fear of mechanical abrasion). If necessary the brilliance of the print may be again increased by re-immersion in water and rolling with a clean roller, after which another re-inking on the cork pad may take place.

Very few precautions need be stressed in connection with the working operations. The print *must* be light, and should bleach in about two minutes, or not greatly over this. The first rolling up should be carefully done to avoid streaks or unevennesses. This is only a matter for a little care. Water on the print surface during the "dry" inking causes white spots and patches. The prints dry very rapidly, and can be dry-mounted within five hours.

The advantages of the process for rapid work need not be dwelt upon here. Particularly in professional portrait

work the speed and reliability will probably lead to its adoption on a considerable scale, where the bromoil process is unsuitable on account of the time necessary to ink a large print. A 15 in. by 12 in. print in "Oleobrom" need not take more than five to ten minutes to complete.

As regards the quality and appearance of the prints, it may at once be said that they are remarkably fine. There is a small but distinct difference from the normal bromoil quality, and when finished with complete absence of grain, they are not unlike carbon prints, with a smooth semi-gloss in the shadows, which are full and rich. A grain can, however, be easily imparted by depositing a little superfluous ink on the print and rolling with considerable pressure. In this way a very beautiful and uniform grain can be obtained.

At present the process is not specially intended for transfer, but it is understood that the prints can be quite easily transferred if desired. All particulars and materials are obtainable from Messrs. Wellington & Ward, Ltd., Elstree. The various stages of the process are covered by patent applications, and the name "Oleobrom" is registered.

END

SINCLAIR BROMOIL

USED BY
THE
LEADING
WORKERS

★★

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PIGMENTS

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