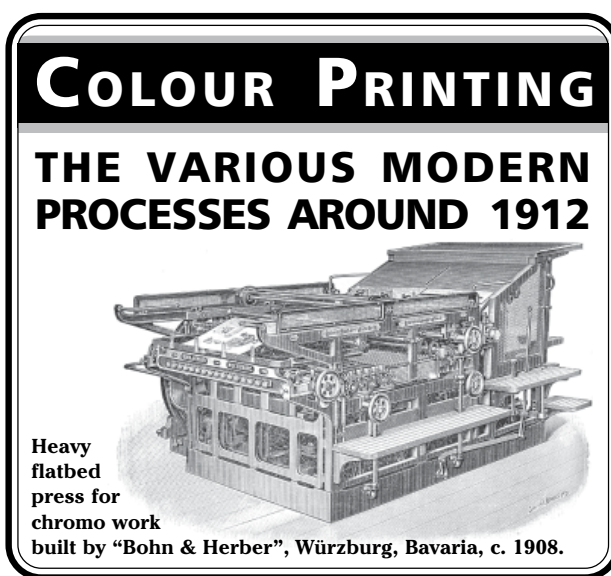


Many readers have asked for technical details on printing processes and terms mentioned in TPA. I always hesitated to answer these requests within the pages of this magazine, as my command of English is too limited for detailed (technical) explanations.

Now I think I have found a good solution for this "problem". An old article which not only explains all "modern printing processes" used before 1912, but which provides also some interesting historical information and, of course the personal/actual opinions and trends of the British authors of that time.

Comments received in the meantime referring to Colour Printing part 1 - 4 in previous TPA issues, show that I was on the right way.



Heavy flatbed press for chromo work built by "Bohn & Herber", Würzburg, Bavaria, c. 1908.

Harry Potterton kindly supplied a original copy of "THE TIMES" (No. 40,000 - Printing Number) from Tuesday, Sept. 10, 1912.

I have reprinted most of this comprehensive article. Unfortunately the names of the authors are not mentioned. Some (company/artist/publication) names the writers refer to are unknown to me. But I strongly believe that this article has answered many questions, put some light on the economic/technical situation in the (art) printing business of that time and has also some entertaining aspects (from today's view).

The illustrations I have chosen come from my printing trade collection. (This is the final part)

Con't from TPA 17: < Part 5 >

## LITHOGRAPHIC PRINTING

Lithography as an art craft held a position amongst the arts for approximately 50 years — 1820 - 1870. It had a beginning in commercial application, and has tailed off again into ordinary business usage. Whereas it became known through the original work of artists, it has now taken the place of the producer of artists' work. The last 40 years have seen this chance gradually take place, and, notwithstanding the reversal in adaptation, the work of to-day stands out almost as brilliantly as at any period of its first century. Its great utility lies in the fact that drawings can be accurately and neatly executed upon transfer paper, stone, zinc, and aluminium, and without much preparation are ready to print. There is no need for either photography or etching into relief to obtain a printing surface from which impressions may be taken at speeds of 1,000 to 3,000 per hour.

The process is a chemical one, and depends upon the combination of a fatty acid with the material used — stone, zinc, or aluminium. The drawing and transfer inks are mainly fats in such a concentrated state that the acid of the fat is very active. When used upon the stone or metal it makes an insoluble compound, and the new material thus formed is of a greasier character or repellent or water. Upon this depends the whole process. For when the material is moistened with water and rolled over with a roller charged with a slightly greasy ink, the ink will adhere to the work which has been drawn or transferred, but will not affect the material where the moisture lies on the surface. This bare outline of the principle involved takes no account of the various manipulations of the printing surface entailed in the business. The feature which governs the method is that the compound of the fatty acid and the material is practically without colour, and may be rolled up with any coloured ink, providing the surface is moist and the ink is slightly greasy.

### CHROMO-LITHOGRAPHS

To outline the course of procedure entailed in making chromo-lithographs the process may be divided into four distinct stages; thus:

(1) THE DESIGN, which may be made by an artist in the printing house; or a picture may be purchased. The design by a lithographic designer is prepared with a full knowledge of the subsequent work, and is drawn accordingly.

The artists in the lithographic draft are frequent exhibitors in art galleries, and some have exhibited at the Royal Academy.

(2) THE DRAWING UPON STONE is done by men of long experience, who execute first a key of the form and all the necessary limits of colours, from which a series of faint impressions in red or blue offset dust is put upon as many stones as there are colours to be used. The artist proceeds to draw, by hand, each separate colour, always having in mind the opacity or transparency of the printing ink which will be used, so that provision can be made for drawing more or less on each stone to superimpose other colours and produce a greater variety of shades or tones. It is in this branch that so much skill and experience are required, the most expert men being able, by their knowledge of colour, to save one, two, or more printings.

The actual draughtsmanship may be in lines, small dots, or on grained stone, in addition to the areas of solid. The ink used is always the same black, fatty matter. But that does not affect the question of colour in the least, as already shown. The disuse of grained stone commenced before 1880, and in its place the artist dotted or stippled on the stone, in a mechanical evenness, which was not subsequently perceptible. After 1885 the hand stippling was largely replaced by mechanical stippling. The latter is done by means of semi-transparent films manufactured with a grained, dotted, or lined surface, upon which transfer ink may be rolled, in readiness to be rubbed down upon the stone. The

best example of these is the *Ben Day* film. Their introduction has been a great boon to both the printing trade and the public. They have saved labour and time, and can be employed for lithographic drawing, and designs for photographic and letterpress production. They have largely cheapened the publication of works by chromo-lithography.

The artist draws the work, stone by stone, not all at once arranged so that a complete view may be taken and stones worked upon promiscuously, but one at a time. Each stone is proved in its colour, and the artist works according to the result of the proofs, until the object is attained. In ordinary work the number of stones seldom exceeds 12 — a large amount is done with only seven stones. But in the best chromo-lithographs the number of stones may be from 12 upwards. In Germany large quantities of work of an ordinary character are worked out in 15 to 19 stones; but in Great Britain such a number is only employed for really high-class products. Posters or labels come within the limit of seven stones. →



(3) THE PRINTING is a machine process, delegated to the best printers, whose knowledge of colour is equal to that of the prover. Each stone is printed consecutively with reasonable intervals to allow the ink to dry on the printed sheet. The printer is well versed in the nature of the inks, driers, and other materials, and is able to temper the inks to print upon thin or thick paper, to dry readily or slowly, with or without gloss, and above all to print inks which will sink sufficiently to permit the rapid printing of another colour upon those already done. He, too, knows the machine well, and has to be able to make all adjustments whereby the printed sheets fall exactly in the same position for every stone, in order that the successive colours shall all be in register. The finished lithograph is entirely dependent upon the printer, assisted only by the artist who passes the colours.

(4) The Finishing includes mounting, varnishing or gelatinizing, eyeletting or adding supports, and the warehouse accessories.

The above description is applicable to the routine followed in all the forms of lithography, from a pickle bottle label to a Christmas card.

Notwithstanding all these high costs for the best artistic work and for skilled labour, lithography is not by any means expensive. There is a character about it, especially in chromolithography, which can only be attained by this method. The use of more than three colours has its compensation in the soft transparency of the work. Even when highly-coloured work is produced, the flatness of the printing surface prevents the occurrence of hard marginal lines such as characterized the surface metal work of *Knight* and *Leighton*, and of more recent times.

#### ADVANTAGES OF LITHOGRAPHY.

Lithography is possibly the most versatile of printing methods. Coupled with the assistance of photo-lithography and collotype, having at its disposal the art of the copperplate engraver, assisted by enlarging and reducing machines and stippling mediums, and with the fatest and most modern printing machinery, no work comes amiss. In its commercial applications it deals with all kinds of private or business stationery, plans, maps, charts, visiting cards, circulars, specifications, autographs, and facsimile work; but little removed from this, box and bottle labels, reel tickets, good tickets and wrappers, cigarette and cigar bands, and music, fall within its domain. Large quantities of catalogues, fashion-plates, manufacturers' patterns are produced by lithography. Posters, show-cards and bills, window tickets, copies of pictures (chromo-lithographs), etchings and engravings, ceremonial cards, programmes, Christmas cards, coloured transfers, and practically everything capable of flat surface printing is claimed by the process.

Latterly, with the advent of the offset process and a better adaptation of photography, the whole circle of printing, whether of the crossline (half-tone) photographic character or of type itself, has become possible.

Lithography, in its broadest sense, is still used for many artistic productions. It is only necessary to look at the posters on the walls, especially those of *Pear's Soap* and the Olym-

pia Exhibitions, for evidences of its extensive application. Formerly lithography was used for book illustration and the publication of excellent pictures in book form, such as the "*Baronial Halls of England*", "*Views of Belgium*", "*Views of Egypt and the Holy Land*", many of which include masterpieces of the art. Probably the highest class of chromo-lithography at the present day comes from such firms as *Messrs. T. Forman and Sons*, *McLagan and Cummings*, and *Nathaniel Lloyd and Co.*



#### USE OF LITHOGRAPHY BY ARTISTS.

The use of lithography by artists is small, and were it not for the beautiful work of Mr. T. Way and a few other members of the Senefelder Club, it might be considered a dead art from the artist's point of view. The craft has had since about 1890 a very strong competitor in the photo-mechanical methods of obtaining printing surfaces. Still, lithography lives and thrives, as it is as indispensable to trade as letterpress printing. Not only is it a greater trade than ever it was, but the introduction of offset printing has given it so much new life and extended its possibilities so greatly that much of the work which has been done by letterpress printing can be done equally well by lithography and at a speed greater than letterpress machines usually attain. It was at one time thought that the three-colour process would very largely supplant lithography. This idea was, however, wrong. The three-colour process created work for itself, which to a very large extent would not have been done by lithography. It would have been expected that many of the well-known great advertisers would have used the three-colour process, yet upon a close examination of the larger forms of advertisements in colour it is surprising to see how seldom it has been used. The three-colour process has increased the desire for "colour", which has benefited the lithographic business.

As the most popular of all pictorial work the post-card certainly holds first place. This was very largely a new industry which arose with the photo-mechanical printing processes. Even in this field lithography has played an important part. Some of the prettiest Continental post-cards are four-fifths lithographic and one-fifth letterpress products. And of all

post-cards yet published the height of perfection has been reached in those which are lithographic throughout, such as those by *Misch & Co.*

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#### PHOTO-LITHOGRAPHY.

Although photography was only known just before the middle of the nineteenth century, it was not long before it was applied to lithography. all the early photo-mechanical processes were applied to flat printing surfaces, and all the developments were made in the art before it was adapted to the production of relief printing surfaces. It was thought that it might be utilized for pictures of continuous tone - i.e., ordinary photographs - but, as all flat printing surfaces require sufficient space in the grain of the work to hold water, the early idea was not realized satisfactorily. The practice of this method was narrowed to its true working capabilities, while the relief method of producing a printing surface in which the tones of a photograph could be obtained with considerable accuracy was utilized as more certain. Photo-lithography has therefore been largely adopted for the reproduction of subjects which have been drawn in straight or curved lines, dots, and grain. This has given a wide field for its usefulness throughout the lithographic business. Perhaps the greatest use which photo-lithography has served is in making enlargements or →



Over and over again you find (small) printing shops run by missionaries, religious institutions etc. for own and educational purposes. This card comes from France, pre-1905. Trappists?



reductions, as well as direct copying. During the last 30 years it has been invaluable, and has saved vast sums of money as well as time in copying or repeating previous work. In the production of surveys, railway guide maps, plans, and the like it has been extensively used to obtain various sizes of the same original. Labels, showcards, and similar printed matter have been copied, enlarged, or reduced, in black or in colours; but perhaps one of its applications which appeals most emphatically is the copying of ancient books, manuscripts, and such antiquities of which but few originals exist, thus bringing within the popular resources those early examples of graphic arts. So great has been the usage of photo-lithography for such purposes that most public libraries have samples in their collections. The process is an aid to lithography, and by far the largest amount of work produced by it never reaches the public, except in a form which is generally unrecognizable.

The method of using it commonly employed is to take a photographic negative – always from a subject in line or dot – and print it upon a sensitized transfer paper. This paper has a thin coating of good gelatine, and is sensitized by immersion in a 5 per cent solution of potassium bichromate. When the print has been made by exposure to light the whole paper is rolled over solid with transfer ink, when the paper is placed in a bath of water where the gelatine absorbs water and readily allows the ink to be wiped off where no photographic print was made. The photographic print retains the ink, and is ultimately in a condition to transfer to stone, zinc, or aluminium for lithographic printing.

The latest developments of this process are direct photography on metals and the *Amphitype* improved photo-litho process.

The direct method has overcome the difficulties of the earlier experiments in that it is capable of placing upon printing plates, photographic pictures in their varying tones, which can be printed at a high speed, and possess more brilliance – *chiaroscuro* – than the relief methods.

It is a variation of the process which may ultimately save the tedium of engraving the hill plates of maps, as already mentioned under Copperplate Engraving.

A development of photography, which was handled by its adherents some five or six years ago, has been adapted to the printer's use. The well-known bromide print can now be treated so that a transfer can be obtained and transferred to flat printing surfaces. This Bromoil process has opened up wide possibilities for the production of posters from actual photographs.

The use of the direct process upon stone or metal has been brought to a high state of perfection in colour printing by *Mr. Frey*. By his method one negative or the three negatives of the three-colour process are used to print upon specially sensitized stone or zinc. The sensitizing film being soluble in certain solvents, it is possible to wipe off as much of the print as necessary to leave sufficient for one of the colours. By the same treatment the whole series of colour plates is produced. The excellence of this method can be seen in most art depôts, where there are art prints of



Cards with views of printers at work as well as interior views of printing firms are not often found. This real photo card was discovered by *Bob Conrich*. A calendar on the right wall tells us it was Monday the 12th of June. The imprinted advertising reads *San Francisco Life Insurance Co.* and there is a good chance that this small printing firm was once found in San Francisco. A notice pinned to the wall next to the calendar reads *Bray's Printing Service* and perhaps it was the name of this firm. At the top left position is another calendar, but unfortunately this area is overexposed and the year date illegible. It must have been a sunny day. This is a tiny firm which printed business cards, letterheads, envelopes and circulars. Seen in front is a small manual paper cutter, the only printing press seen is a letterpress machine of smaller format and most likely not electric driven but by pedal. Fine authentic view, although this firm had nothing to do with ppc printing.

watercolour drawings so like the originals as to be easily mistaken for them. By this process many of the finest chromo-lithographs have been produced.

## COLLOTYPE

The public knowledge of collotype is very limited. It is probably seldom suggested that the beautiful Photochromes have collotype as their basis. And many prints which pass as photographs or Woodburytypes are collotypes upon special paper. The reproduction of many old documents such as the *Magna Charta* can only be effective by collotype, because it is the purest form of photographic printing known in the trade. The vellums of old, with their creases and stains, are readily photographed in minute detail, which the collotype process alone can reproduce. Collotype has filled that vacancy which photo-lithography could not do satisfactorily. But it is a much slower and more expensive method. The negative used is an ordinary full-toned photograph, and can be printed upon the film of gelatine which has been rendered sensitive by the admixture of potassium or other bichromate. The distinctive feature of the collotype lies in the gelatine film, as technically prepared, being capable of automatic granulation, thus affording the necessary water spaces between the inked printing points. It is a process much less used in Great Britain and America than in Germany; and it is only the most skilled craftsmen who have the patience to labour against the constant failures. Its beauty of production, however, saves it from annihilation. It is the art publisher's handmaid; and not a few manufacturers have employed it for their choicest products.

Every print is pulled from the surface of the gelatine film; and it is in the inconstancy of this film that the difficulties of cheap production are rendered insurmountable. A variation of the process, which has been before the public for over 25 years, is the permanent ink photo-print. This is produced by causing the gelatine to reticulate to a larger extent, so opening the grain of the photograph that a transfer may be taken and put upon flat printing surfaces, from which it can be printed with ordinary rapidity.

This has been further taken advantage of in the photo-stone process, where a series of transfers is put upon stone, and each worked up by an artist to give the colour-plates. Amongst the most noteworthy of the prints so made are "The Toast to the Chef", and "The Cardinals". Many others of equal excellence have been published. This process was patented for use upon stone only, and a further patent was taken by *Harrap and Crawford* for its application to aluminium, in which the preparation of the colour-plates was greatly simplified by the use of special chemicals.

Many of the art treasures of the world have been photographed and printed by collotype methods. Much of this work has been the product of the firm of *Mr. W. Griggs*, of Peckham, now absorbed by *Messrs. Carl Hentschel, Ltd.* —

**Ed. note:** "Modern Printing Processes c. 1912" reprint started in TPA 14 – enough of that now. Maybe I continue with this old article some day. - Next issue comes a well-illustrated article on a German collotype printing firm, that concentrated on ppc production.