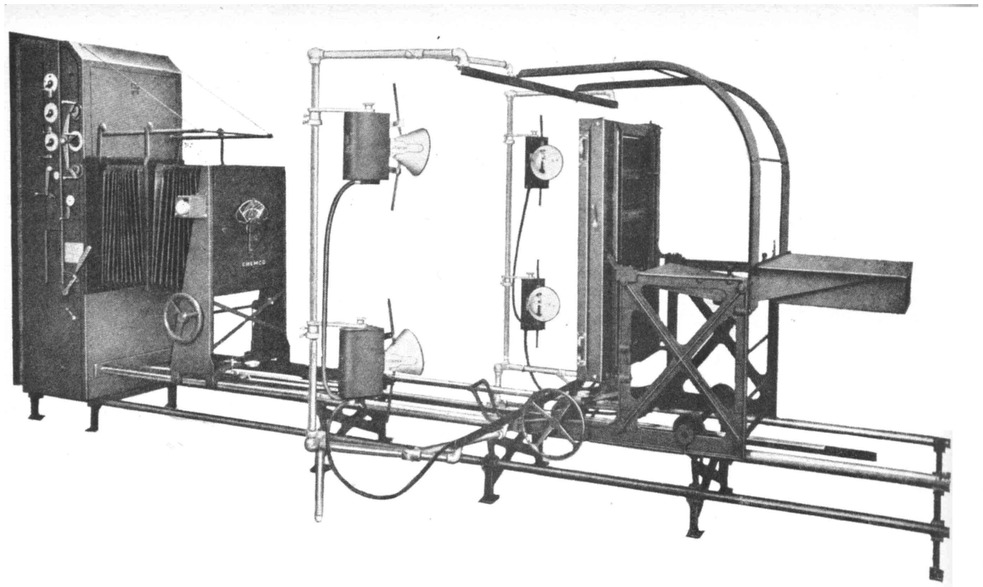
Photoengraving

Photography was invented in the 1840s, and soon became one of the wonders of the age. The camera obscura, projecting a picture onto a screen had been used for centuries, especially by artists, (Durer drew two illustrations of its use to study perspective), but now the image could be captured permanently. Its potential use in printing was twofold: could it be used to produce printing surfaces, and could photographs themselves be reproduced in some way? Sure enough, the new chemical processes that photography used led to a variation on the old artists' technique of etching, to cut illustrations from metal plates, the process known as **photoengraving**. Reproducing photographs followed closely with the use of **halftones**, described separately.



The important point to bear in mind about photoengraving is that the printing surface is either raised (to put ink on paper) or lowered (to make no impression). The process is thus an either/or one, pure black & white, unlike normal photography, where in a black & white picture, there are shades of grey. The starting point is a black & white image, which is reproduced as a negative on high-contrast film. The cameras used for this work soon evolved specially, and were known as **Process Cameras**. They were usually very large, since printing plates were often the full size of the sheets of paper printed. A typical camera would take a plate a metre wide, and would stand two metres high, with about four metres from the board with the illustration being copied to the back of the camera. The same process cameras also produced the negatives for lithographic plates, and for gravure cylinders, and process-camera work became a highly-skilled trade.

The engraving part of the process started with a sheet of metal, usually copper or zinc (engraved plates were referred to as **zincos**). This was coated with a light-sensitive chemical, potassium dichromate dissolved in egg albumen, rather than the familiar silver nitrate in gelatine used in ordinary photography or in the process camera. The negative from the process camera was laid on top of the sheet (and held in close contact by a vacuum to ensure pin-sharp detail), and the exposure made using an arc-lamp or other high ultra-violet light source: the potassium dichromate was not very sensitive to ordinary light. Exposure slightly darkened the coating, but more importantly hardened it, and the unexposed parts could be washed away, exposing the metal. The plate was now etched with nitric acid to cut away the non-printing areas.

The main difficulty in the process was the tendency of the acid to cut away sideways as well as down, thus undercutting the sides of the printing areas. In order to cut deeply enough for practical printing, the sides had to be protected. The original process for this was to etch briefly, then dust the plate with a red resin called **Dragon's Blood**, which heating fused onto the sides of the cuts. A second stage of etching could then be done, and this repeated, usually for three or four steps.

After the Second World War the manufacture and industrial machining of magnesium for aircraft production had been developed, but left a postwar glut of facilities and new outlets were sought. One result was the development of the **Dow Etching** process for making plates. The plates, now of magnesium, were prepared as before, but now put in a machine that sprayed a mixture of acid & oil on from various angles as the plate was spun around. The oil clung to the edges of the etching, protecting it like the old powder method. This method saved much labour, and made plates much cheaper.

The last major development in the field was the use of photopolymers, plastics which are light-sensitive. A thin metal sheet covered in a layer of photopolymer is exposed to ultraviolet light through a negative of the required image, which hardens the polymer. The unexposed areas can then be washed away with a mixture of warm water and alcohol. This process was very simple, and avoided corrosive chemicals. A further advantage was that because the polymer was transparent, the light hardening it spread slightly as it penetrated the plastic, and the edges of the hardened (printing) areas were therefore naturally sloped, and thus supported.

It was reckoned that photoengraving made tens of thousands of the old wood-engravers who cut the illustrations for Victorian book, magazines & newspapers, redundant, but it led to a great increase in the number of illustrations used, and of course to a far more realistic reporting of information and news to the readers when it reproduced photographs as well. Now the new technologies of computing and electronics have made it and the highly-skilled camera operators in turn redundant (even in most non-letterpress print methods).

John B Easson at The Quarto Press, March 2004. Set in Windsor Light.