WATER MARKING

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If a sheet of paper is held up to the light one sees what is known in the trade as the formation of the web, or the structure of the fibres from which the web has been made. A watermark is a localised modification of this formation which produces a corresponding change in opacity, introduced while the paper is wet. This applies if the sheet has been produced by a modern continuous process or by the old batch 'hand-made' methods. Such marks can consist of a design or a word group and are a permanent part of the sheet of paper.

The sheet may also have 'watermarks' other than these precise patterns or messages, in the form of 'laid' lines running closely together, 15-20 to the inch. There are other 'chain' lines, running at right angles to the laid lines which are often an inch or so apart. In the case of hand-made paper these lines are caused by the position of the wires which make up the construction of the mould.

If the sheet of paper is hand made, the actual method of producing a wire mark by the disturbance of the web formation differs from the machine-made or continuous process. With hand-made paper the forming mould will have other wires in the shape of the pattern, sewn on to the wire-cloth forming surface. For machine-made paper the wire pattern is fixed to a lightweight hollow roll covered with a wire mesh. The technique, in this case, is to rest the roll lightly on the moving web while it is still wet.

The study of wire marks has become a science in itself and various techniques are used to record the precise shape and dimensions of a given mark. For example, beta radiographic methods are now used which have the advantage of allowing precise reproduction of the watermark without mutilating the sheet of paper in question. Examination and classification of marks can lead to compiling a complete history of a paper mill or the story of the papermaker's life. At the same time, it can be used as a method of authentification in the age of a manuscript and has been used on countless occasions in the discovery of forgeries.

The first authentic watermarks can be found in papers made in Fabriano, Italy, in 1282. Earlier Chinese and Middle Eastern papers did not have such marks. The earliest known

examples of English watermarks are those of Thomas Tate in 1490. They were originally evolved to serve as trade marks, indicating the size and quality of the sheet and often showing the location of a mill together with the owner's name and maybe the date of manufacture.

Later, some watermarks became works of art. For example, the more elaborate ones appearing almost as a type of photograph, such as the heads and designs on British currency notes. These are generally known as Chiaroscuro marks and their preparation requires a great deal of skill. First a suitable photograph or engraving is obtained and the artist engraves a facsimile on a wax plate so that the thin section of wax produces the highlights while the thicker zone makes the shadows. From this wax engraving a plaster cast is taken to make a die using electrolysis techniques. The die is then further treated to give it hardness and a wearing surface. Often, a second die, an intaglio version, is also made. The next part of the proceeding is to transfer the image on the die to the wire mesh of the mould. This is carried out by annealing the mesh and then pressing it into the die. Eventually the paper web is formed on the surface of the mould which has its surface identation of the pattern to be reproduced. The resulting web will vary in thickness, being thin at the high spots and thick at the darker zones, so that when held to the light the effect of light transmission through the varying thicknesses presents a photographic light image.

Sir William Congreve devised a method of watermarking in colour, the aim being to overcome counterfeiting. Webs of paper were made in two thin layers between which were sandwiched other layers in the form of coloured designs, the coloured layers being produced by using a stencil laid over the mould surface and cut to the required shape. The technique was extremely tedious and could only be applied to hand-made paper, never becoming of real commercial significance.

It must be appreciated that this is a very simple account, and I recommend to anyone who requires to explore the subject more fully, a booklet entitled **Water Marks** written by Cohen and produced by Curwen Press. It contains some interesting examples of watermarks and has a very good bibliography

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