

SOME COMMENTS ON THE ART OF PAPERMAKING

by Brian Attwood

Although in the immediate surroundings of Bristol there are now only a few remaining paper mills in operation, including one in which paper is still made by hand, it is a fact that the Bristol Area, Cotswolds to the north - Mendips to the south, has a historic importance in the development of the British Paper Industry. A distribution map of paper mills in the United Kingdom in the mid 18th Century shows three main areas having a high density of mills, these being around the town of Maidstone in Kent, and around High Wycombe in Buckinghamshire, both close to London. The third area of high density was the Bristol district. BIAS is currently carrying out a survey of some 30 sites within a radius of approximately 25 miles of Bristol.

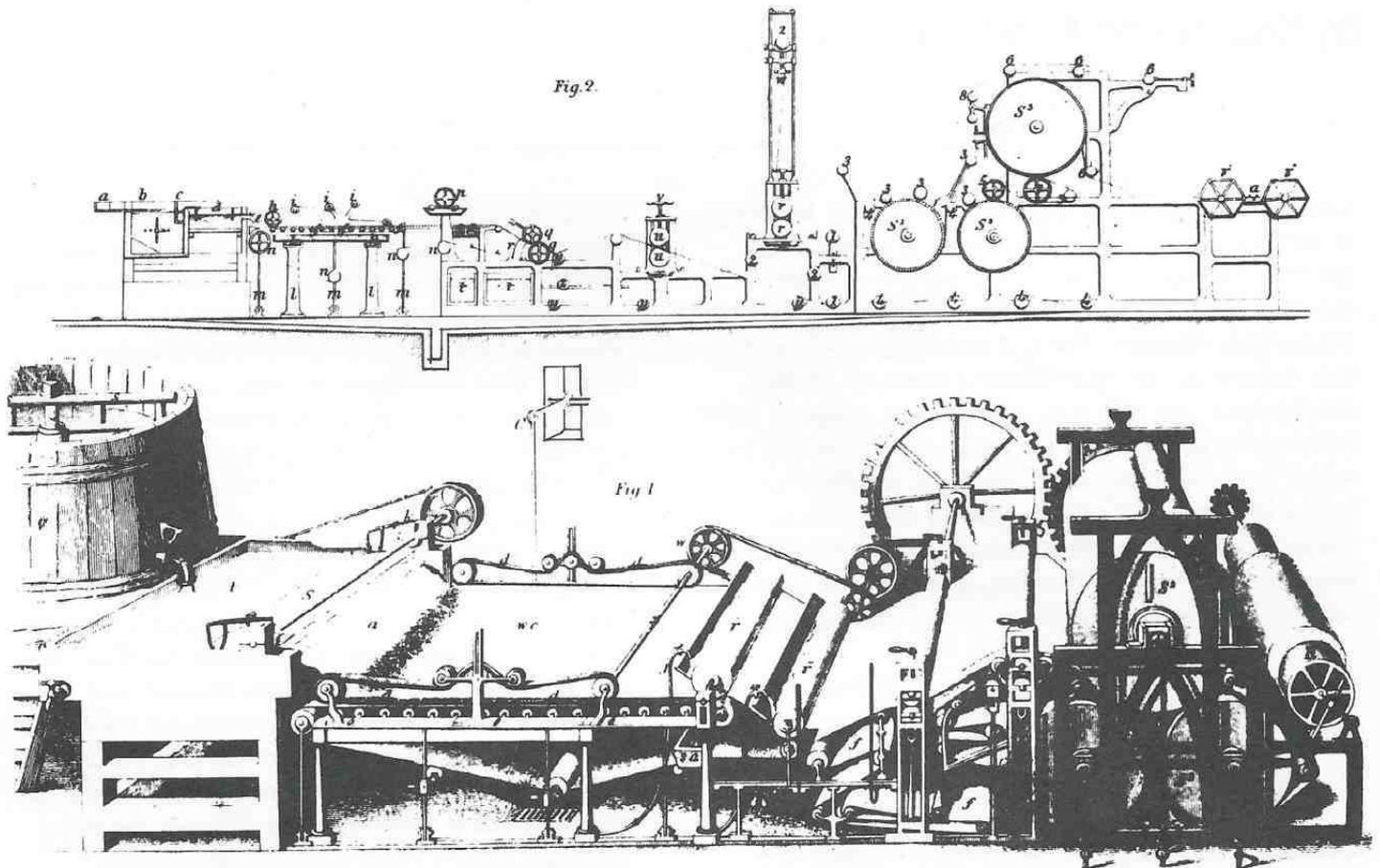
The papermaking process has evolved slowly over the years from its discovery, usually credited to Ts'ai Lun in China in about the year 105 A.D. In the original papermaking process each sheet of paper was made separately, and this was the method of operation right up to the beginning of the 19th Century, when methods of making paper in the form of a continuous web were invented. Today the hand-made process has virtually vanished from the European scene, although we have at Hodgkinsons, Wookey Hole, one of the few commercial hand-made paper mills in operation in the United Kingdom. The art of hand-made papermaking can also be seen in the form of demonstrations at paper museums in Holland and Switzerland.

The basis of papermaking is the disposing in layers of vegetable fibres, using water as the carrying medium. It is a fact that these fibres must be relatively short, and because most natural fibres are too long and thick, in their natural state, to allow a well-formed sheet to be prepared from them, the first part of the papermaking process is the treating of these fibres to ensure that they take on a more manageable form. In its most elementary form, the vegetable matter is pounded, a process known in the trade as beating. Often the raw material is first chemically treated, for example boiled in caustic soda, which separates the required fibres from other materials, the unwanted materials being washed out of the system. A typical beating machine is the Hollander, which owes its invention to Dutch papermakers in the mid 18th century, in this machine the vegetable fibre matter is repeatedly passed beneath a heavy revolving roller. When sufficient treatment has been given to the raw

material, it is transferred to a container known as a vat, where it is highly diluted with water, approximately 1 part fibre to 300 parts water.

The sheets of paper are formed from this fibrous suspension, using equipment known as a mould and deckle. The mould is a wooden frame over which is stretched a screening material, such as a woven wire mesh. Surrounding the mould is a second framework similar to a picture frame, this is known as the deckle. Its object is to confine the fibrous suspension to the wire screen area. When the sheet of paper is to be formed, the mould together with its deckle is dipped into the fibrous suspension in the vat, it is then removed from the vat, picking up at the same time some of the fibrous suspension. Drainage is then allowed to take place, later the deckle is removed and we have left behind on the surface of the mould a wet sheet of paper. This wet sheet is carefully transferred to a blanket, covered with a second blanket, and the operation repeated until there is obtained a pile of wet paper layers, interleaved with fabric blankets. The stack of sheets and blankets is transferred to a screw press, where further water is extracted by means of pressure. The pile is then removed from the press, the paper webs, now containing approximately 70 per cent water, are carefully removed from the blanket, and laid out to dry and mature.

In the process described above, there is of course a great number of separate skilled processes, and it is these which through the ingenuity of engineers over many years, have been converted into the continuous operation of papermaking today. In the Science Museum, South Kensington, London, there is a small section devoted to papermaking. Among the exhibits one can see hand moulds, a model of the first continuous papermaking machine, and models of very modern paper and board machines. There is not, at the moment, in the United Kingdom, a national paper museum, but steps are being taken to house initially a collection of equipment, at Manchester University, to be transferred later to a permanent situation in the proposed Manchester Museum of Science & Technology.



PAPER MAKING MACHINE (from TOMLINSON'S CYCLOPIEDIA) 1853

Editor's Note:

The following notice was issued from St. Anne's Board Mills Company Limited in January, 1970.

Brian W. Attwood, Technical Department Manager, St. Anne's Board Mills Company Limited was awarded the Silver Jubilee Medal of the Technical Section of the British Paper and Board Makers Association for contributions over a number of years to the advancement of paper technology.
