

THE JOURNAL
OF THE
Board of Arts and Manufactures
FOR UPPER CANADA.

OCTOBER, 1868.

BARBER & BROTHERS' STRAW PAPER
MANUFACTORY AT GEORGETOWN.

In several numbers of this journal we have alluded to the history, manufacture, and general importance of paper, as a material necessary for the diffusion of knowledge, and one which has grown into an actual necessity of life in one form or another. For more than half a century the attention of manufacturers in all countries has been directed to the discovery of some cheap substitute for rags as a paper material, but hitherto without success, although it is now alleged, as will be seen by reference to page 228 of this journal, that paper made from maize or Indian corn stalks, after the process of extracting the so-called maize-flax has been effected, promises to become of considerable importance in those countries where maize is grown as an article of food. In England, the United States, and more recently in Canada, paper from wheat straw, with a small admixture of rags, is largely manufactured; and as a portion of the newspaper press of Canada is supplied with so-called straw paper, consisting of 70 to 75 per cent. of straw, and 25 to 30 per cent. of rags or manilla, the processes employed in the manufacture, acquire a general interest, the more especially as there still remains room for improvement in the production, of cheap and good paper from wheat straw, both in respect of cost and quality.

Straw paper is no novelty, indeed it may be said that there is no common vegetable substance of a fibrous character which has not been tried as a paper material. Straw, and especially wheat straw, appears to answer the purpose better than any other known product, as far as cheapness goes; but there are not wanting many sanguine inventors even in Canada who think that they have discovered in other vegetables the raw material which shall afford the rising generation cheap and good paper for all useful purposes, and especially suitable for the printing press.

We may remind enthusiasts in paper materials—and their name is legion—that all vegetable substances whose fibre has a corrugated edge, are suitable for the manufacture of paper. The extent to which such material can be applied is altogether a question of cost, and depends upon the chemical nature and quantity of the impurities to be removed. With rags, many of the impurities have been

already abstracted by the different processes to which the cotton or linen fibre has been subjected, so that the work is already half done, and the discovery of a cheap paper material would at once lessen the price of rags, which are continually accumulating, without the general introduction of woollen clothing should largely supersede the use of cotton and flax in temperate climates, a contingency which is certainly not likely to happen to such an extent as of itself seriously to affect the price of rags. The problem, however, is an attractive one, and promises well, if due attention is given to the cost of preparing the raw material, and the strength, beauty, finish and durability of the manufactured article, for as yet no one has succeeded in making, from any other fibre, paper equal in all or in many respects to that produced from "rags and tatters."

In order to reduce straw to a suitable consistency for paper-making, it is first cut into lengths, and then winnowed to separate the knots. The coarse part is reserved for brown wrapping paper, the finer portions of the straw are introduced with an alkaline mixture into a strong boiler, where it is subjected for a period of five hours to a boiling process, under a pressure of steam varying from 100 to 120, and sometimes in England to 150 lbs. to the square inch.

The alkaline liquor is composed of about 7 parts carbonate of soda, and 8 parts of lime, mixed with water; the effect of these agents is to dissolve the flint or silica of the straw under a high temperature, and convert it into an alkaline soluble silicate, which, when withdrawn from the fibre, leaves the vegetable or organic portion in such a soft condition that it may be easily reduced to pulp after being subjected to the action of the beating engine, when it is ready to be bleached. The abstraction of the silica causes the straw to lose one-half in weight, whereas rags lose only one third, by the process to which they are subjected. If the silica be not removed, the paper is so brittle as to unfit it for printing purposes, and the readiness with which some varieties of coarse straw paper tear in any direction is due to the presence of the silica, which the alkali, under great pressure and consequently heat, ought to have converted into a soluble condition, so as to ensure its subsequent removal by washing with pure water. The knots and fragments of weeds which are not removed by the winnowing process, frequently escape disintegration, even after prolonged action in the boiler, and if they are not separated by an after-filtering process, to be presently described, they render the paper spotty and detract from its appearance and value.