

Machinery.

Three machines for dressing the fibre require mention in this Report as having attracted attention during the past year on account of the improvements they afford on the stripping machines in ordinary use. The first of these is Mr. Pownall's machine, a description of which, abridged from his patent, dated 25th September, 1870, will be found in the Appendix, p. 23.

This machine, which scrapes only half a leaf at a time, but on both sides, was exhibited at work in Wellington, and performs the mechanical operation of scraping with less injury to the fibrous bundles than any other machine I have seen at work, and approaches most nearly of any to the Native method of preparation, the fibre differing only in the absence of the peculiar lustre which is retained by the fibrous bundles when torn out of the leaf by the Maoris. Mr. Pownall's machine is somewhat expensive in its construction, and the principle has not yet been sufficiently tested on a large scale to prove if it can be economically applied. At present its comparatively slow motion, and its only dressing half a leaf at a time, is against its adoption for the preparation of pure roping fibre, as the highest market price is obtained for such fibre when produced by more rapid, and, therefore, less expensive machines. At the same time the power required to work this machine is moderate, and there is no reason why the width of the scraping drums might not be increased, and the whole leaf fed through an aperture shaped so as to gradually flatten out as it approaches the scrapers, so that the preliminary expense of splitting the leaf would be avoided, and twice the quantity would be put through with the same time and labour as in the present form of the machine. I understand that Mr. Pownall is at present engaged in improving it in these respects.

The second machine to be noticed is also one in which the leaf is scraped on both sides by two ordinary strippers through which it is successively passed. It has been constructed, with other improvements, under the direction and at the expense of the Canterbury Flax Association; and the fibre prepared by this process is reported to have taken a very high price in the market, ranging from £42 to £45 per ton.

The only machine towards the perfection of which assistance has been sought from the Commissioners is that which was referred to in last year's Report as having been designed by Mr. T. Kelly. This machine, without involving any novelty in the principle of construction, adopts many improvements in detail that have been suggested by actual experience, as described by Mr. Kelly in the Appendix, page 3. The machine has not yet been tested by actual use, but the full-sized model and drawings have been sufficient to satisfy Mr. Kebbell and other competent judges that the improvements suggested will be of great advantage in raising the quality of the fibre and reducing the expense of production. The object which the Commissioners had in view in granting assistance was the construction of a machine—1st. That will clean at least 35cwt. per day on the average for a long period. 2nd. Capable of being adjusted and repaired without loss of time; and 3rd. So put together that duplicates of those parts most likely to give way should be supplied with the machine, and arranged so that they may be fixed in their places by an ordinary mechanic, so that the machine may be used in localities remote from workshops. These requirements appear to have been attained by Mr. Kelly's machine, but it would be more satisfactory to have it submitted to actual trial.

The subject of the improvement of the machinery now in use, and the more thorough investigation of certain points relative to the chemical character of the fibre in different stages of preparation, appear to me to be the only matters for which it is important that any further expenditure should be incurred by Government.

In conclusion, I venture to state that a perusal of the appended papers cannot fail to impress the conviction that the *Phormium* fibre is now not only fairly established as a marketable article, but that various other uses are being discovered for the short fibre, tow, and other *bye-products* of the process at present employed.*

I have the honor to be,

Yours obediently,

JAMES HECTOR.

The Hon. the Colonial Secretary, Wellington.

* A compilation of the more important parts of the previous Reports of the Flax Commissioners has been prepared by direction of the Government to meet the frequent applications for information on this subject, the supply of extra copies of the Official Papers being exhausted.—“*Phormium tenax* as a Fibrous Plant,” edited by JAMES HECTOR, 140 p.p., 8vo. Wellington, 1872.