impairs its strength, only to be restored by slow drying in the open air. In this respect it resembles jute."

By the foregoing quotations, from an undoubted authority, all the objections urged against our fibre have been satisfactorily answered—*the bleaching evidently requiring further experiment;* and although it is to be feared, from the lapse of time, that Mr. Burns' valuable secret is lost, yet it is not impossible that some ingenious head and dexterous hands may invent and perfect a machine that will secure as good or perhaps a better result; and, to encourage us in this hope, we should remember that, until a hundred years ago, spinning was performed by the hand-wheel, when Hargreaves' invention of the "spinning-jenny" superseded it; this, a few years later, was improved upon by Arkwright; and within ten years of the time when spinning was done entirely by hand, Samuel Crompton invented his machine, which, from its partaking of the characters both of Arkwright and Hargreaves' inventions, he denominated "the mule," by which name it is known at the present day.

"The mule" produces a much softer fibre, and one trebly as fine as any known in England at the time of its introduction. In 1812 (a tardy recognition of his services, for it took place thirty-three years afterwards), for his valuable invention Crompton received a Government grant of £5,000.

What appears chiefly to have militated against the successful introduction of New Zealand flax into England, has been its small, intermittent, and uncertain supply; but if a large and constant export of it can be maintained, there is I think no doubt that it will meet with a ready sale, and that in time many new uses will be found for it. There is reason to hope that this will now be the case, for from the table of flax statistics attached to the Colonial Treasurer's financial statement of last July, flax must be leaving our shores in enormously increasing quantities.

The following is the table I allude to:—

Value of flax exported for	1866	... ...	£996
Ditto ditto	1867	... ...	4,136
Ditto ditto	1868	... ...	8,137
And for	1869 (1st quarter)	... ...	7,614

Or at the rate of over thirty thousand pounds sterling per annum; and this quantity will no doubt annually increase, if the fibre be approved of.

No. 14.

Lecture on New Zealand Flax by Mr. McKay, Senior, at Nelson, 1869.

Introductory Remarks.

As this subject is now engaging so much public attention, the present paper, containing some suggestions derived from an experience of the treatment of the *Linum usitatissimum*, as well as from some attention to that of the *Phormium tenax*, may not be unacceptable to those who are interested in the utilization of the latter.

General Deductions on the Relative Nature of the Two Plants.

Although the botanical structure of the *Phormium tenax* is of a different class from the *Linum usitatissimum*, its fibrous texture, while similar, is double the strength, verifying its affix of *tenax*, and capable of a much wider range of adaptation.

Professor Lindley gives the comparative strengths of fibre as follows:—

Silk	34
Phormium tenax	23
European hemp	16
European flax (*Linum usitatissimum*)	11

In the able and exhaustive paper, on "Flax and its Uses," which Dr. Williams has already favoured the Association with, it will be seen in the comparative chemical analysis of the two plants that, while there is little difference in the aggregates of their respective constituents, whether acids or alkalies, when taken singly, an excess of phosphoric acid and lime and a deficiency of sulphuric acid and potash particularly characterize the Native plant, and that therein lie on the one hand its superior vigour and the strength of its fibre as compared with the European, and on the other the greater difficulty experienced in its manipulation into a marketable commodity.

To investigate further at present, however, the relative chemistry of either, would tend rather to the hypothetical than the useful, and the more so when it can be shown that, with some modifications rendered necessary by the botanical and chemical differences just referred to, the most effectual method of treating the *Phormium tenax* is the same as has been pursued from the earliest times in the case of the *Linum*.

If we only look into the history of the latter, from the time of Pharaoh to the present day, we will find that much care was taken of its growth, skilled treatment bestowed on the manufacture of its fibre, and commercial importance attached to the fabrics it produced. See Exodus ix. 31, and 1 Kings x. 28; also Pliny's Natural History, wherein the latter describes the growth and subsequent treatment of flax by the Romans as conducted pretty much in the same manner as at the present time; that the flax of Cumæ, in Campania, esteemed for the fineness and toughness of its fibre, was employed in the manufacture of hunting-nets, and some of these nets were of such a degree of fineness as to allow of their being passed, together with their ropes, through the ring of a man's finger; and also, in his time, a portion of a linen corselet which had belonged to Amassis, a King of Egypt, 600 B.C., each strand of which consisted of the enormous number of 365 fine threads, was exhibited in Rome as a specimen of strength and fineness of fibre, as well as of skill in the preparation and spinning of thread. Much, therefore, as the improvement has been in different appliances for the separation and manufacture of flax fibre, nothing in modern times can compare with the fineness, strength, and complexity of the thread used in making the nets and corselet just referred to.

By no special chemical process, such as Schenck's, Claussen's, or any other, neither by any purely mechanical means, has there ever yet been a satisfactory production of fibre; for in the former it is