there is no doubt, I should say it is an established fact, for years ago both in Belgium and Ireland it has been already spun into the finest lawn),—I do not think we here in New Zealand could employ our time to greater advantage than in endeavoring to find out in what part of the process our method of separating the fibres of the *Phormium tenax* differs from that employed in the disintegration of all other fibres used for any but the very coarsest and commonest applications, and in what respect our present system is defective, and in endeavouring to discover the means of remedying the part defective, paying all due attention to economy.

The manufacture of the fibre of the New Zealand flax, as at present carried on, consists in first cutting the flax leaves. This is generally paid for at so much per ton weight. Most of the weight of the leaves lies in the butt-ends, and it is obviously to the advantage of the cutter to get as much butt as he can in; by this means he materially lessens the quantity to be cut, and economizes his own labour. With regard to the manufacture, this portion of the leaf contains all the objectionable substances, such as gum, colouring matter, coarse fibre, &c., and is the most difficult and troublesome part to clean through all the subsequent operations. The leaves are then subjected to the beating or scraping action of the quickly revolving stripper, which in a great many cases injures the fibres quite as much as it cleans them, for it is almost impossible so to regulate a machine that revolves with the high speed of the stripper so that it will clean both the thick and the thin ends of the leaf equally. The fibre is then washed and sometimes left soaking in a running stream for, say, one or two hours, certainly not longer, as this steeping, when carried beyond a certain duration, is found to discolour the fibre. As an experiment to show how ineffective this washing process is to do more than clear away the loosened particles of vegetable matter still adhering to the fibre, take some of the gum, which can easily be done by scraping it from the outside of the leaf, and soak it in water, say for two hours, then pour off the water and see if your gum has dissolved. I may here mention that this gum has been found to be one of the most insoluble of mucilaginous substances, and that quality is in great demand as a substitute for the compound now in use for uniting the so-called adhesive envelopes. Now this gum being by the action of the stripper driven into and among the fibres as they are partially separated, carries with it a certain amount of the other substances which help to build up the structure of the leaf, and causes them firmly to adhere to the fibres; also at the same time occasioning the fibres themselves to cohere to one another, forming a harsh brittle mass that would require a very lengthened immersion in water to loosen and separate. When the washed fibre is submitted to the water-scutcher, it is obvious that a greater quantity of gum &c., is scraped off, but as it can only operate upon that portion of the gum, &c., deposited on the outside of these bundles of fibres, it can easily be understood that a very considerable quantity still remains imbedded among the fibres, and which the action of the water-scutcher fails to reach or disturb. After drying, the effect of which is to harden and concentrate the gummy mixture on the fibre, it is operated upon by the dry-scutcher. The process is then considered complete. We have now obtained the fibre in a condition in which each apparently individual fibre is composed of numerous finer fibres which are glued together, and stiffened much in the same manner as the hairs of a brush used in our common mucilage bottle when allowed to dry. It is this adhesive and detrimental compound that we have to get rid of before we can produce fibre in a fit state for the spinner.

Let us now see how a process something similar succeeded when tried upon the Irish flax (*Linum usitatissimum*), and what the best authorities have said upon the subject. In taking our examples from the mode of working other fibres and applying them to the cleaning of the *Phormium tenax*, do not let us lose sight of the fact that all fibres have this gummy substance in their surroundings to be overcome before they can be worked up into textile fabrics.

It appears to me to matter little in what manner the fibre is encased in its natural covering, whether it is embedded in a leaf, like the *Phormium tenax*, *Bromelia penguin*, *Bromelia sylvestris*, cabbage-tree, pine-apple, aloe tribe, &c., &c.; or in the main stalk of the plant, as in flax, hemp, species of nettles, as the *Urtica nivea*, *Urtica tenacissima*, &c.; or in the main rib of the leaf, as in Manilla, plaintain, banana, &c.; this gummy matter is always present, and is in all cases the great and insurmountable obstacle to the effectual and economical extraction of the fibre.

Some fifty years ago a most ingenious machine was invented to separate the filamentous parts of the stalk of flax and hemp, by means of bruising them, instead of previously submitting them to the dissolving action of steeping, and notwithstanding the hopes to which the invention gave rise at its first appearance, its inefficiency was soon discovered. The reason why this and all similar machines must ever be incompetent to perform the office required of them is clearly explained thus by a celebrated and practical writer on the subject. "Maceration," he says, "is an operation indispensable to obtain a tissue for making cloth. It may be said it can be dispensed with in case of fibre for rope-making. I do not admit even this supposition. The portion which furnishes the tissues is composed of an infinity of longitudinal fibres lying one over the other, and joined together not only by the force of adhesion proper to vegetable tissue, but still more strongly by a sort of gummy substance which unites it to the woody part. No mechanism whatever can clear the fibre from this substance. Maceration is the only process capable of dissolving and decomposing this substance, and of giving to the tissue the flexibility, brilliancy, and disposition to subdivide to the greatest possible extreme, according to the nature of the fibres. This operation appears to act in two ways, by fermentation and solution. Chemical processes are the only ones capable of obtaining from unmacerated fibre tissue of fine and supple quality. But it should be remembered that these processes obtain such a result only as far as they are equivalent to the maceration for which they are substituted. The gummy substance remaining on the fibre after it has been prepared by the machines that have been invented, is dissolved by the chemical apparatus, and the fibre experiences the same effects as it would have done from maceration before it was bruised. The only difference in the two cases consists in the greater loss which must necessarily occur in the second instance."

We will now glance at the manner in which Manilla and plaintain fibre is extracted:—

"The fibre is found to be coarse and strong in the outer layer of the sheathing footstalks, fine and silky in the interior, and of a middling quality in the intermediate layers. The fibre is separated by crushing between rollers in a mill, or by fermentation. If by the latter process, the stems when cut down are heaped together near where they are grown, and shaded from the sun by laying leaves over