

seconds, half-clean hemp or thirds, and hemp codilla. The first sort is quite clean, the out short is less so, and the half-clean contains a still greater portion of shive, and moreover is of mixed quality and colour. The part separated or picked out in cleaning hemp is called codilla hemp. Manilla is also assorted according to colour or quality. Jute in like manner, and even the fibre from the cocoa-nut husk, is assorted.

In conclusion, I do not think there is any great reason to be uneasy about the future in store for the fibre of the *Phormium tenax*. It only requires that the manufacturers on this side of the Line shall send it home to their brethren in the old country dressed in a more perfect manner; and as the fibre itself and the requirements of the Home market come to be better understood, there is no fear but that the ingenuity of our fellow-colonists will speedily devise means to prepare it in the state most in demand in the market to which it may be sent; but to be of any great service to those now engaged in the flax trade, whatever is to be done should be done at once. Therefore I would impress upon those persons engaged in endeavouring to improve the means of extracting the fibre, and at the same time increasing the value of the product, that *Bis dat qui cito dat*.

## No. XI.

### FLAX AND ITS USES.

[A Paper read at a meeting of the Nelson Scientific Association, by Dr. Williams.]

IN the year 1844, a company was formed in England (having no connection with the New Zealand Company, as has been erroneously stated) for the purpose of producing from the *Phormium tenax* a marketable fibre; machines, and a staff of workmen were sent out, officers to superintend appointed, and land for erecting the necessary buildings was purchased in England. The enterprise, from various causes with which we have nothing to do, failed.

The machines sent out were found to be unsuitable for the purpose for which they were intended—that of dressing the green leaf; and when the operations of this Company came to an end, other machines were improvised with such skill and material as were obtainable on the spot, and flax-dressing was still carried on to a limited extent, and the fibre spun and manufactured into various useful articles, such as wool-packs, sacks, &c. Door-mats, cushions for chairs, and twine were also made from it, and a material for stuffing mattresses, which last has ever since, by a very easy process, been produced here—to obtain it the green leaf is simply hackled and dried.

With the early application of the *Phormium tenax* fibre to manufacture here, Mr. Luke Nattrass's name is associated, for under his superintendence it was commenced. The articles now upon the table are his property, and kindly lent by him. Mr. Sigley wove the yarn spun from the fibre dressed by Mr. Nattrass at the period I allude to, nearly twenty years ago. The colouring matter of the brand upon the sack is composed of black-fish oil and the ash of the Motupipi coal, both Native productions.

Mr. McGlashan, a few years later, adopted a method of preparing the fibre nearly, if not precisely, identical with the process described by Mr. Travers in his highly interesting paper published in the "Transactions of the New Zealand Institute." The leaves were first boiled, then twisted into ropes, passed through rollers, the green refuse washed away, and the fibre hackled and dried. From this Mr. McGlashan manufactured ropes and lines of many kinds.

In connection with the early struggles of flax-dressing in Nelson, many more of our settlers might be named, some of whom formed a company, and succeeded Mr. McGlashan; but after a long and patient trial they were compelled, from want of encouragement, to abandon it at a considerable pecuniary loss, and, with the exception of a very few, all have, ever since that time, looked upon flax-dressing as a profitless industry.

Plants yielding fibrous substances which are capable of being spun and woven into cloth and other fabrics, and useful for various purposes in commerce and the arts, are very numerous, and by no means confined to any particular family or order, or to any one quarter of the globe.

The European flax of commerce is the woody fibre of the stem of the *Linum usitatissimum*, or flax plant of the old country, belonging to the natural order *Linaceæ*. This fibre is spun into yarn and woven into cloth, called linen. Its seeds are valuable for many purposes; linseed oil is obtained from them, also an oil-cake for fattening cattle.

Of the supply of this flax required by the United Kingdom, Ireland and Russia each contributes about one-third, the remainder is imported from Holland, France, and Belgium. In the Great Exhibition year, 1862, the value of linen fabrics and yarns exported from Great Britain and required for the home trade amounted to eleven millions sterling.

Linen manufacture is of so ancient a date that its origin is unknown; the cloth wrappings of Egyptian mummies are of this material.

Hemp is the rind of the woody stems of *Cannabis sativa*, nat. order *Cannabiæ*, to which also the hop plant belongs; this order is botanically nearly allied to the nettle tribe. From the *Cannabis sativa*, grown in India, where it is called *Cannabis Indica*, a highly intoxicating and narcotic drug, called *bang* or *haschish*, is obtained; also a medicinal preparation used in hydrophobia, tetanus, and some other convulsive disorders.

Manilla hemp is the fibre of the stems of the *Musa*, or plantain, nat. order *Musaceæ*. The fruit of this tree, and that of the banana, a smaller variety of it, are, both raw and cooked, universally used for food, and the trees composing this group are amongst the most important of any to the people of those countries where they grow.

The coir of commerce, which is twisted into yarn, spun into ropes of all sizes, and used for matting and many other purposes, is the outer covering of the fruit of the cocoa-nut palm, nat. order *Palmeæ*. The sap of this tree when fermented produces a strong spirit called arrack, which by further fermentation yields sugar. Its fruit, the cocoa nut, is valuable as food, its leaves as thatch, and indeed every part is eminently useful to the inhabitants of tropical countries, to which, like the plantain and banana, it indigenously belongs.

Cotton is obtained from the *Gossypium*, or cotton plant, nat. order *Malvaceæ*, or the mallow