

prepared which must prevent its adoption. In addition, there is a danger of hurting its strength, and unless washed with great care, the result would be its gradual deterioration.

Oil, as might be expected, has little or no action. Alcohol, even if it could be economically employed, is useless, as it exerts no decided action upon those substances which have to be removed.

The use of caustic, or carbonate alkali, alone, though very beneficial in some respects, is very objectionable in others. They enable us to clean the fibre with ease, but at the same time they impair its strength, always indeed imparting to it a brownish tint, which can scarcely be looked upon as other than a sign of decomposition.

In the use of the last chemical experimented on, soap, we have all the advantage obtained by the use of the alkalies above, without their disadvantages, but the high price of this article would prevent its adoption for this purpose if used alone. If, however, as before stated, the acid of the flax was first neutralized with carbonate of soda, the use of a small quantity of soap would effect the rest without incurring the least danger or adding much to the expense of the operation.

The fibre obtained in this way is easily cleaned, is not discoloured, and appears as strong as that prepared without the use of chemicals.

The only remaining process requiring comment is the modified retting process, and which, in our opinion, is likely to be the most promising, as it involves no expense in chemicals, and but little in fuel. When properly performed, it will, without doubt, give results equal to those obtained by any of the other processes, and in one respect superior, the woody tissue which binds the fibres together in bundles being in this case so much affected by the decomposition of the gummy matter, that it offers little impediment to the splitting up of these coarse fibres into hair-like filaments by the hackling machines.

Moreover, in comparing this process with those where the application of chemicals is mainly relied on, or where machinery is the only aid, it will be well to bear in mind that, of the many ingenious methods invented to supplant the ordinary retting of the common flax plant, not one of them has been adopted on an extensive scale; for, though they effect a considerable saving of time, the manufacturer finds there is a deterioration of the product, and prefers the flax which has been prepared by the old process. It is, therefore, not unlikely that so long as attempts are made only by chemicals and machinery to prepare the New Zealand flax for the market, we may never be able to obtain for the fibre that consideration from the manufacturer which the superior strength of the raw material should entitle it to.

The retting process which may, therefore, be recommended as the result of the foregoing inquiries is as follows:—

In the first place, there is the absolute necessity that the leaves of the plant should be thoroughly bruised.

Secondly, the bruised flax must be placed in vats or pits of water till it scrapes clean with the nail, and no longer; it may be found more convenient to accelerate the commencement of decomposition by the use of artificial heat. The decomposed leaves should then be washed by being placed in a running stream, after which the flax is ready for scutching in the ordinary manner. There can be no doubt as to the success of this process, and the only additional expense over that necessary for the preparation of the ordinary flax is the preliminary bruising of the leaf. When the price of labour in the Colony is reduced from the existing high rate of wages, and the New Zealand flax plant is systematically cultivated, the above process should allow of the production of a valuable quality of fibre, for which there would be a steady demand with a large profit.

No. III.

CLASSIFICATION OF PHORMIUM TENAX.

(Extracted from Appendix to "Annals of the Diocese of New Zealand," page 241.)

I. Flax scraped with the finger-nail only (*Tihore*).

1. *Paritanewha*, found chiefly at Maungatautari, N.W. of Lake Taupo.
2. *Ratawa*, found Hauraki (valley of the Thames).
3. *Kohunga*, found Maungatautari.
4. *Rerehape*, found Maungatautari.
5. *Oue*, found Maungatautari.

II. Flax scraped with the shell (*Haro*):—

1. *Raumoa*, found chiefly at Taranaki.
2. *Ate*, found chiefly at Hauraki.
3. Common swamp Flax, found in all parts.

III. Coarser kinds, used only for rough garments and floor-mats:—

1. *Aonga*, variegated Flax.
2. *Whararipi*.

I. All the varieties of flax of the first class must be planted. They require rich, moist, and flat land, but not swampy, and should be planted in rows six feet apart, with spaces of six feet between the plants. The ground must be kept clear of weeds. The best season for planting is April or May. The plants will be fit to cut in two years, and will yield a crop every year afterwards. The flax requires only to be rent with the hand and nails, without scraping, and is prepared with the greatest ease.

II. The more common species of flax requires to be scraped with a shell, then steeped in water for four days, afterwards taken out and beaten to clear it of the refuse, and then dried again and scraped a second time.

III. The third class is of no value for European manufacture.

Flax of the first class is also found in Native plantations on the north shore of Cook Strait, especially in the neighbourhood of Manawatu, Whanganui, and Patea Rivers.

It is the leaves of the plant which contain the valuable fibre resembling that of the European flax.