

home with regard to the supply from America, hitherto depended upon, falling short in consequence of the destruction of negro labour in the South. The value of cotton consumed in the United Kingdom in 1868, amounted to forty-one millions of pounds sterling, and the weight of the cotton was 996 million lbs.

Certain defects are alleged as belonging to the *Phormium tenax* fibre. I will now deal with them. They are—

1. That the New Zealand fibre is brittle and harsh, and therefore has not a sufficiently soft texture called “spinning quality” or “nature,” and is on that account also liable to break at a knot more readily than other rope.

2nd defect: That it will not take tar, and therefore cannot resist wet, but is liable to rot from alternate dryness and moisture.

3rd defect: Its too easy decomposition under the action of alkaline solutions, which might perhaps make it unsafe to attempt to bleach it by the same means employed for linen.

I will now endeavour to rebut these charges authoritatively:—

In Mr. Charley’s “Report on New Zealand Flax,” published in the Journal of the Society of Arts, and inserted in the appendix to his valuable little work, often before alluded to, he remarks:—

“I found the objection hitherto urged against the fibre was its extreme brittleness, owing, it was supposed, to the large amount of silica in its composition; but this brittleness had been successfully overcome by the application of a process invented some years ago by a person named Burns; but that this process, though successful in its operation, was so expensive as to suit only in the laboratory.

“This Mr. Burns asked my informant Mr. Herdman (an eminent Belfast spinner) the modest sum of, I believe, £20,000 for the use of his invention, and showed *on paper* a beautiful theory of profits resulting therefrom, amounting to £14,000 a-year! Mr. Herdman was not sanguine enough to accept this proposal, and the matter fell to the ground.

“By the kindness of the latter gentleman (he continues), I am enabled to forward to you, in different stages, three samples of the *Phormium tenax*—two in a partially prepared state, and one in yarn.

“The half of the rough flax has been treated by Mr. Burns, exhibiting the extraordinary change effected by his process; the other half of the same stem (he did not evidently know it was a *leaf*) being kept unaltered to show the contrast.

“This process is, of course, a secret; but the result is believed to have been effected by the application of some powerful acid on the silica or silicates of the non-fibrous portions of the dried plant. A peculiar quality of the *Phormium tenax* fibre (he goes on to say) is, that it hackles out to almost inconceivable fineness; the divisibility of the fibre appears very great, and the sample thread of yarn sent herewith will show how fine the first experiment in spinning at once reached to.

“The proposal of Mr. Burns occurred so long back as the year 1836 or 1837.

“Mr. Herdman thinks that Burns is alive (1853) and in Manchester, but does not know his address.”

In a foot-note Mr. Charley adds—“Dr. Robertson, of the Observatory, Armagh, was, I understand, the first person to recognize the talents of Mr. James Burns, who was a resident in that town at one time.”

It is not therefore *impossible* to render it fit for weaving; and if, after a fair trial, it is proved to be liable to break at a knot more readily than other ropes, and that this fault cannot be prevented, then, in using it, knotting should be avoided as much as possible, and, if practicable, altogether.

With regard to the second defect—that of not taking tar—quoting again from Mr. Charley’s report, I find the following statement made by Mr. James Lemon, an extensive rope manufacturer of Belfast. He says:—“I think the sample received is capable of much improvement, and, if properly handled and better cleaned, could be used in ropemaking as a *good* (this word is italicised by Mr. Lemon) substitute for Russian hemp; and, from its superior strength, would, I think, in time (when it came to be used and tried) be preferred. I have had the small sample spun into rope-yarn and *tarred*, and I find it receives the tar in equal proportions to that of Russian hemp, which is an important thing for the preservation and durability of the rope.”

By the foregoing we find that the second charge against our fibre is unsustained, and that *it is* capable of absorbing tar *if properly prepared*, so as to render it fit for exposure to the weather; and for all other uses, as in mills, factories, and wherever it can be kept under cover, its exceeding strength has long since recommended it.

We now come to the third and last defect, with regard to the difficulty of bleaching our fibre; and I find that this alleged defect was well known to Mr. Charley, and was considered in his report to the Society of Arts, in which he says concerning it:—

“In my last report I stated, with some hesitation, that the fibre appeared very easily damaged by alkaline solutions.

“The process of bleaching employed on common linen would not, I think, be safe with New Zealand manufactures. This difficulty, however, might in all probability soon be overcome, by instituting a series of careful experiments. The example of fibre No. 2, owing to the dew-retting (a process for preparing the European flax now nearly extinct in Ireland), the use of soap as described, and long exposure to the weather, is almost half-bleached, without the strength of the fibre being much, if at all reduced. The sample No. 5 is nearly bleached white under a very simple process, namely—one immersion in dilute chloride of soda, and afterwards in dilute sulphuric acid, being washed between each immersion with pure water.

“The solutions used were of the customary strength for linen, yet the fibre appeared much weakened when tested *damp*; but, when *dry*, I was rather surprised to find it regain, in a great measure, its original tenacity. It would seem from this that it is the *dampness* of the bleaching process, quite as much as the actual operation of the chemical compounds employed, that is destructive to the New Zealand flax. One of the chief recommendations of lignine, or *pure fibre*, is that it is little acted on by acids or alkalis, unless very concentrated. It is strange, with all its great tenacity, the *Phormium tenax* is so easily acted on by such solutions, and that even simple water, for the time,