

MANILA HEMP, the most valuable of all fibres for cordage, the produce of the leaf-stalks of *Musa textilis*, a native of the Philippine Islands. The plant, called *abacá* by the islanders, throws up a spurious stem from its underground rootstocks, consisting of a cluster of sheathing leaf-stalks, which rise to a height of from 15 to 25 ft. and spread out into a crown of huge undivided leaves characteristic of the various species of *Musa* (plantain, banana, &c.). From 12 to 20 clusters are developed on each rhizome. In its native regions the plant is rudely cultivated solely as a source of fibre; it requires little attention, and when about three years old develops flowers on a central stem, at which stage it is in the most favourable condition for yielding fibre. The stock is then cut down, and the sheathing stalks are torn asunder and reduced to small strips. These strips in their fresh succulent condition are drawn between a knife-edged instrument and a hard wooden block to which it is fixed. The knife is kept in contact with the block except when lifted to introduce the ribbons. Sufficient weight is suspended to the end of the knife to keep back all pith when the operator is drawing forward the ribbon between the block and knife. By repeated scraping in this way the soft cellular matter which surrounds the fibre is removed, and the fibre so cleaned has only to be hung up to dry in the open air, when, without further treatment, it is ready for use. Each stock yields, on an average, a little under 1 lb of fibre; and two natives cutting down plants and separating fibre will prepare not more than 25 lb per day. The fibre yielded by the outer layer of leaf-stalks is hard, fully developed and strong, and used for cordage, but the produce of the inner stalks is increasingly thin, fine and weak. The finer fibre is used by the natives, without spinning or twisting (the ends of the single fibres being knotted or gummed together), for making exceedingly fine, light and transparent yet comparatively strong textures, which they use as articles of dress and ornament. According to Warden, "muslin and grass-cloth are made from the finest

fibres of Manila hemp, and some of them are so fine that a garment made of them may, it is said, be enclosed in the hollow of the hand." In Europe, especially in France, articles of clothing, such as shirts, veils, neckerchiefs and women's hats, are made from *abacá*. It is also used for matting and twines. It is of a light colour, very lustrous, and possesses great strength, being thus exceptionally suitable for the best class of ropes. It is extensively used for marine and other cordage. The hemp exported for cordage purposes is a somewhat woody fibre, of a bright brownish-white colour, and possessing great durability and strain-resisting power. The strength of Manila hemp compared with English hemp is indicated by the fact that a Manila rope $3\frac{1}{4}$ in. in circumference and 2 fathoms long stood a strain of 4660 lb before giving way, while a similar rope of English hemp broke with 3885 lb. The fibre contains a very considerable amount of adherent pectinous matter, and in its so-called dry condition an unusually large proportion, as much as 12% of water. In a damp atmosphere the fibre absorbs moisture so freely that it has been found to contain not less than 40% of water, a circumstance which dealers in the raw fibre should bear in mind. From the old and disintegrated ropes is made the well-known manila paper. The plant has been introduced into tropical lands—the West Indies, India, Borneo, &c.—but only in the Philippines has the fibre been successfully produced as an article of commerce. It is distributed throughout the greater part of the Philippine Archipelago. The area of successful cultivation lies approximately between 6° and 15° N. and 121° and 126° E.; it may be successfully cultivated up to about 4000 ft. above sea-level. The provinces, or islands, where cultivation is most successful are those with a heavy and evenly distributed rainfall. H. T. Edwards, fibre expert to the Philippine bureau of agriculture, wrote in 1904:—

"The opportunities for increasing the production of *abacá* in the Philippines are almost unlimited. Enormous areas of good *abacá* land are as yet untouched, while the greater part of land already under cultivation might yield a greatly increased product if more careful attention were given to the various details of cultivation. The introduction of irrigation will make possible the planting of *abacá* in many districts where it is now unknown. The perfection of a machine for the extraction of the fibre will increase the entire output by nearly one-third, as this amount is now lost by the wasteful hand-stripping process."

Hitherto, while numerous attempts have been made to extract the fibre with machinery, some obstacle has always prevented the general use of the process. The exports have increased with great rapidity, as shown by the following table:—

1870	31,426 tons.
1880	50,482 "
1890	67,864 "
1900	89,438 "
1904	121,637 "

In 1901 the value of the export was \$14,453,410, or 62.3% of the total exports from the Philippines. The fibre is now so valuable that Manila hemp cordage is freely adulterated by manufacturers, chiefly by admixture of phormium (New Zealand flax) and Russian hemp.