

The growth of the industry in Canada has been very great, and the demand is more likely to increase than otherwise, as wood-pulp will undoubtedly continue to be used in the manufacture of paper, particularly in the coarser grades, and for many other purposes. As an instance of the growth of this industry it may be mentioned that in 1881 there were but five mills in Canada, with an invested capital of less than £13,000; in 1891 the figures were twenty-four mills, and £600,000; in 1901 there were thirty-six mills, and £4,000,000 was invested or appropriated for expenditure.

If there are any industries in which New Zealand can hope to excel it will be such as will utilise the natural sources of power with which she is so bounteously endowed. Wood-pulping calls for such cheap power. If, for climatic purposes, it is advisable to afforest our watersheds and poor land, such afforestation could also be made commercially profitable if suitable pulping-woods were planted. Early maturity and a continuity of forest-growth for industrial and climatic purposes would be secured. There are, doubtless, many instances where it would also pay to pulp the native sapling-growth which is at present destroyed during felling for sawmilling or when clearing for pastoral purposes.

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(2.) SECONDARY FOREST-PRODUCTS.

In a report entitled "New Zealand Timbers, Bark, and Secondary Forest-products," by T. Kirk, F.L.S., published in 1886, the following particulars are given relating to possible utilisation of forest-products at present almost entirely disregarded:—

Tar.

Tar may be extracted from many of our native trees, especially from the pines, kauri, totara, kahikatea, rimu, miro, matai, tanekaha, &c., also from the tooth-leaved and other beeches, and in all probability from the large kinds of rata and tea-tree. The waste tops and branches of trees felled for timber, crooked pieces, knots, roots, &c., can be used for this purpose, so that the manufacture of tar and allied products would not only afford a profitable outlet for labour, but would remove a great source of danger and materially reduce the serious loss arising from forest-fires.

In the forests of the White Sea and the Baltic tar is extracted from the Scotch fir and Baltic spruce fir, the wood and roots being cut into short billets and then subjected to a process of slow combustion. A funnel-shaped cavity of any convenient size is excavated in the side of a sloping bank; an iron pan is fitted tightly into the bottom of the hole, and communicates with the exterior by a pipe or tube which passes through the side of the bank, and allows the tar to be drawn off as fast as it is extracted. The billets are now tightly packed in the cavity, ends downwards, until it is completely filled, when the surface is covered with turf, which is compactly beaten down by two men, one of whom uses a wooden stamper, the other a wooden mallet, so that the outer surface is sufficiently firm to prevent the escape of the volatile product. A small portion of the turf is now removed, and fire applied to the stack; as soon as it is kindled the turf is replaced. The exuded tar is received into the pan at the bottom of the hole, and is discharged by the spout into casks, which are at once bunged and made ready for shipment.

Pitch.

This is obtained by boiling wood-tar until nearly one-half of its bulk has evaporated, when the remainder is allowed to cool and harden into pitch. The process is usually effected in copper boilers set into brickwork, to diminish the risk of accident.

Lampblack.

This is merely the soot given off during the manufacture of tar or charcoal. It is deposited on the sods which cover the billets, and must be scraped off. If closed ovens were used, instead of the rough process indicated above, the lampblack would be deposited on the roof.

Resin.

Resin from kauri-gum is well known, and needs no description; but, although a "shake" or fissure of any kind in the trunk of the rimu or kahikatea is always found to be compactly filled with resin, no attempt has been made to collect it for commercial purposes. In Southern Europe resin is largely collected from the pine-trees.

Turpentine.

This may be regarded as resin held in solution in a volatile oil. It is produced by numerous pines and other trees. Actual experiments are necessary to determine to what extent the pines of New Zealand can furnish a substitute for the turpentine of Europe and North America; but there can be little doubt that large quantities can be obtained from the kauri, rimu, kahikatea, and others, by incision of the outer bark in a similar manner to that practiced in the United States. Common turpentine is extracted from the Scotch fir, Baltic spruce, larch, pinaster, and silver-fir; in North America from the loblolly pine and the Georgian pine (*Pinus australis*).

Potash.

This is extensively prepared from wood-ashes in Europe, Canada, and the United States, where it enables the settler to defray a large portion of the heavy cost of clearing forest land. Potash-salts are found in varying proportions in all plants, and are most abundant in the young branches and leaves.