

In the month of March the flow of sap commences, and continues to the end of August. In the former month the bark and sap-wood are cut or hacked for a few inches above the box, which is gradually filled, the flow increasing in quantity as the weather becomes warmer, so that the box is filled in about two or three weeks. The surface of the box should be lightly chipped over once a week, and the bark hacked afresh, the wounded portion being slightly increased in height each time until, in the course of years, it is carried 15ft. or more above the box. The turpentine is removed as often as necessary, and the resin that has dried on the surface of the boxes is carefully scraped off and often mixed with it.

If the process be carefully conducted, trees may be profitably treated in this manner for forty or fifty years. The first year's produce is always the most highly valued, and is called "virgin dip." The resin scraped from the surface of the wound forms the common frankincense, or "gum thus," of the druggists, and is the chief ingredient in the incense used in Roman Catholic places of worship, serving as a substitute for the expensive *Olibanum*, or true frankincense of Arabia.

Turpentine is obtained from the larch by boring auger-holes in the trunk  $\frac{3}{4}$  in. to 1 in. in diameter, taking care not to reach the centre of the tree. The holes are slightly inclined upward, and have a tube or small gutter tightly fitted into each, with a tin canister or small bucket suspended from the outer end to receive the turpentine. The buckets are examined every morning, and the turpentine removed. A mature tree will yield from 7lb. to 8lb. of turpentine yearly for forty or fifty years. The turpentine is often found collected in small cavities in the larch exactly as in the New Zealand "red-pine." In some cases the cavities are closed with a plug, and the turpentine allowed to remain until it assumes a pasty condition, when it is removed with an iron spoon. The yield is, of course, greatly reduced, but the durability of the timber is preserved. Turpentine from the larch was formerly known as "Venice turpentine."

In some pines, as the silver fir, in which the wood is destitute of resin ducts, the turpentine is contained in small cavities formed beneath the bark. In the months of July, August, and September it is collected by Italian peasants, who visit the alpine districts for that purpose. Each carries a small sharp-pointed tin cone or flask, with which he punctures the bladders in the bark, and extracts the turpentine, which he pours into a tin bottle carried at his belt. The loftiest trees are ascended by the aid of climbing-irons, so that the work of collection is extremely laborious. The turpentine is strained, to free it from fragments of bark, leaves, and other impurities, when it is ready for sale. It is known in the market as "Strasburg turpentine," and formerly commanded a high price.

The barbarous plan of cutting boxes in the trees would not be adopted in New Zealand, at any rate, when it is desired to continue the process of extraction for a lengthened period. Tin or zinc troughs or boxes could be readily fixed to the trunk, or even sunk in the ground at its base, and the turpentine conducted to them by grooves, or some other simple contrivance. In this way even the kauri might be made to yield a supply of turpentine for some years without material injury to its timber. Of course, where a clearing is about to be made, and it is not thought worth while to convert the timber, the object is simply to obtain the greatest yield in the shortest time; in this case incisions may be multiplied and cavities deepened without taking ulterior results into consideration.

The amount of turpentine and resin which our native pines are capable of yielding involves several points of direct interest to the botanist as well as to the merchant and settler; I therefore venture to suggest to settlers in forest districts, and especially to the proprietors of kauri and kahikatea forests, the desirability of ascertaining the yield of the different species by actual experiment, which might be commenced at once. In any case the results would be of great value, and their publication would confer a boon upon the community. The rate of flow should be carefully noted, and the variations caused by changes in temperature observed. It would be advisable to try different methods of extraction with the same kind of tree, giving the preference to those which cause the least injury to the timber.

The Westland pine appears to merit particular attention: in common with the red silver pine it would probably afford turpentine of special value for certain purposes, although the yield of either would, in all likelihood, be comparatively small.

#### OIL OF TURPENTINE.

This is manufactured by distillation on a large scale in the Southern States of America. The turpentine is placed in copper stills of large capacity and is distilled without water; the volatile oil is received into barrels direct from the still, and is ready for market.

The resin remaining after the oil has been extracted is drawn off into a vat containing water, which separates it from all impurities, when it is packed for export.

#### POTASH.

This is extensively prepared from wood ashes in the forest districts of Germany, Russia, and other European countries, also in Canada and the United States of North America, where it enables the settler to defray a large proportion 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.

The process of extraction is simple and inexpensive. All parts of the plant, including the leaves, are burnt in dry pits dug in the earth from 3ft. to 5ft. in depth, and of any convenient size. The ashes are placed in tubes or vats, each having an orifice near the bottom secured by a plug, and a false bottom covered with straw or rushes. The ashes are saturated with water, and after standing about twelve hours the potash liquor is drawn off and taken to the evaporating pans, usually shallow iron vessels, sometimes with corrugated bottoms. It is now kept in a boiling condition and constantly stirred, fresh liquor being added from time to time as required, until the whole