

about 2in. of bark between the two, and continued to the same height. This is repeated until the entire circumference of the trunk has been wounded, when the old incisions are found to have become sufficiently healed to bear a repetition of the process. When it is intended to remove the trees for firewood or for the manufacture of tar, incisions are made all round the trunk at the same time and regardless of length.

The resin which hardens on the surface of the wounds is very white, and is scraped off to be used in the manufacture of wax candles; it is termed "barras." The liquid resin is termed "galipot;" when collected it is placed in wooden vats sunk in the earth. In this state it contains fragments of bark, earth, and other impurities. In order to purify it, it is placed in large copper boilers, with brick flues or chimneys to carry off the smoke; it is kept boiling, and is constantly stirred. In order to ascertain when it has been sufficiently boiled, a small portion is poured on a piece of smooth wood; if, when cool, it crumbles freely on pressure between the fingers, it is considered ready for filtering, which is effected by pouring it over a layer of straight straw or rushes about 6in. in thickness, when it is allowed to run into casks, and becomes the brown resin of commerce.

Yellow resin is manufactured by frequently adding cold water, a few drops at a time; this causes the resin to expand, when it is allowed to pass through a tube, previously fixed in the side of the boiler, into another vessel. From this it is ladled back into the boiler, the operation being continued until the resin becomes perfectly clear, when it is filtered into sand moulds, forming cakes from 100lb. to 200lb. in weight. The straw and waste material are utilized in the manufacture of lampblack, as already stated.

As it is not thought advisable to make any wound of greater length than 18in. to 20in. during one season, from eight to ten years will usually be required to operate upon the trunk to the height of 12ft. or 15ft. A short pole, with sloping notches to receive the feet, is used by the operator when the incisions are more than 6ft. or 7ft. from the ground. An expert operator does not require more than two or three minutes to ascend the tree, form a new surface to the wound, and descend. He is expected to attend to between two hundred and three hundred trees per diem, and to take the entire management of from fifteen hundred to two thousand trees each season. It need scarcely be remarked that eight hours does not constitute a working-day in the district under notice.

BURGUNDY PITCH.

This was formerly manufactured in Finland, Austria, Switzerland, and the Grand Duchy of Baden, by boiling the crude resin of the Baltic spruce, straining and evaporating until the proper consistency was attained. The manufacture of the pure article has greatly diminished of late years, so that now it is not easily obtained.

The substance usually sold as Burgundy pitch is a compound made by melting Bordeaux or American resin, and mixing it with palm oil, a little water being added during the process of mixing to render it opaque. It is obvious that the local demand for an article of this kind could be readily supplied from local resources, as the manufacture can be carried on in the colony at a very small cost.

TURPENTINE.

Turpentine may be regarded as resin held in solution in a volatile oil. It is produced by numerous pines and other trees, but varies considerably in value, some kinds being used chiefly for the manufacture of resin—as that of the pinaster, for instance; while the turpentine obtained from the silver fir simply requires straining to free it from accidental impurities, and render it fit to be used in the manufacture of clear varnishes.

Mastic and Chian turpentine are obtained from *Pistacia lentiscus* and *P. terebinthus*, but the quantity is inconsiderable when compared with that obtained from various pines. In Europe common turpentine is extracted from the Scotch fir, Baltic spruce, larch, pinaster, and silver fir; in North America from the loblolly pine (*Pinus taeda*) and the Georgian pine (*Pinus australis*).

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 practised in North Carolina and other Southern States.

In some countries the resinous matter obtained from the trunk by excision is collected in baskets, which are placed over earthenware jars, so as to allow the fluid portion to drain off, forming the common turpentine of commerce. The solid portion is boiled in order to purify it, when it becomes ordinary resin.

The process of extracting the turpentine from the pinaster has been already described under the head "Resin." Turpentine obtained from this source, however, is of inferior quality to that obtained from the Georgian pine, and until the diminution of the American supply, caused by the civil war in 1863, it was chiefly used for the manufacture of resin; but during the continuance of the struggle it was imported into Britain in large quantities, which gradually diminished as the yield of the American product again increased, until at the present time it forms only one-tenth of the entire quantity imported; it is sold under the name of Bordeaux turpentine. In North Carolina, Georgia, and Alabama turpentine is extracted from *Pinus australis* and *Pinus taeda* in large quantities. During the winter months small cavities, termed "boxes," are cut in the trunk of the tree at about 12in. above the ground. The boxes slope inwards, the bottom being from 4in. to 5in. below the lower lip, and of sufficient width to hold from one and a half to three pints of fluid sap. From one to four boxes are made in a trunk, according to its size and diameter. A trunk 15in. in diameter should have three boxes, each holding about a quart. The boxes are cut with a long narrow axe, and require from eight to ten minutes each to make.