

bleeding, however, has in recent years been conducted in a fairly systematic manner and under some sort of control, the method followed being, briefly, as follows: V-shaped cuts are made in the bark of the tree, horizontally across the barrel. The cut is called the "tap," and is deepest at the apex, where it almost reaches the sap-wood. Taps are cut around the limbs and barrel of the tree, and are spaced 18 in. apart horizontally, the interval between such rings of taps being about 6 ft.

Some forests are leased for bleeding purposes shortly before being cut, with the stipulation that no taps are to be made in the barrel of the tree. Others are leased without restriction, and the trees are tapped and bled from head to foot. The former system is called "bleeding heads only," and the latter "bleeding heads and barrels."

After the tapping is completed the tree is left undisturbed for six months, when the crop is collected, and thereafter the gum is harvested every six months.

There is a great diversity of opinion as to whether bleeding is injurious to the growth of the tree and detrimental to the timber when the tree is cut down and sawn into boards, but there is no reliable information available on the subject. No investigations have been made up to the present on the effect of bleeding carried out in a scientific manner, either in so far as it affects the strength and durability of the timber or causes any possible injury to the growing tree.

The bleeding of coniferous trees for resin and turpentine is a great and valuable industry in the United States and other countries, and has been for many years the subject of scientific investigation. Full particulars of these investigations are given in Bulletin 229 of the United States Agricultural Department, 28th July, 1915. With regard to the formation and flow of resin in the living tree, it is stated on page 10 of the Bulletin referred to: "No universally accepted theory dealing with the formation of resin has as yet been advanced. It is generally conceded, however, that resin is formed as a by-product during the transformation of food materials, such as starch, into woody tissue. The resin is stored in two systems of elongated passages or resin-ducts. In one system the ducts are parallel to the pith of the tree; in the other they lie horizontally in radial planes. The ducts form in the growing tissue or cambium layer just beneath the bark, the two systems intersecting to form a continuous network of resin-passages. When the cambium layer is cut the growth of tissues near the wound is stimulated, and the number of resin-ducts, and consequently the amount of resin formed, is considerably increased. The area in which additional or secondary resin-ducts are formed apparently extends from 2 in. to 3 in. above, and to a lesser distance below the wound. The additional ducts require from two to four weeks for their formation full of resin. If a new cut is made just above the old one, after the additional ducts have had a chance to form, the flow will show a large increase over that obtained from the original wound, due to the additional ducts." (For a full description of the methods adopted in climbing and bleeding the kauri-tree see C-12, 1916, pp. 8 and 9.)

Research work in this connection is now being carried out at the Auckland University College on behalf of the Forestry Department. We think it is desirable that this research should be prosecuted vigorously. The results of the investigations may go to show that the kauri should in future be regarded not as a tree for producing building-timber, but, like the rubber-tree, as a source of annual revenue, the gum being taken from it under a proper and scientifically tested system.

A matter affecting the production of gum is the fact that a great many of the Dalmatian gum-diggers have left the gumfields and are returning to their own country. One witness who gave evidence said that their reasons for leaving New Zealand are that they were not given an opportunity of taking up land, and were dissatisfied with the treatment they received. In this connection it may be pointed out that prior to the War Regulations coming into force all naturalized Dalmatians had the same rights as other British subjects to take up land in New Zealand. This is especially the case in regard to the provisions of section 20 of the Land Laws Amendment Act, 1912, under which land in kauri-gum districts may be selected on very easy terms. The departure of these men will no doubt seriously affect the amount of gum produced, as they are strong and vigorous, most of them in the prime of life, and not afraid of hard work. They will also dig in deep ground which older men and the Maoris show a disinclination to tackle.