

reserve near Rotorua, young pukatea saplings up to 6 ft. in height were losing all leaves; and the fallen tree trunks, which always carry a population of timber-tree seedlings, were bone dry, so that on one of them alone an observer counted six rimu seedlings from 1 in. to 6 in. in height all recently dead from drought. Even more striking are Auckland reports which speak of mature taraire as dying, especially on exposed rocky faces, and Hawke's Bay reports which record rimu and black beech as dying within forest stands. These are not to be interpreted as disasters which any amount of forestry foresight could have prevented, but rather as an instance of the extreme conditions that every forest stand has to encounter at intervals during its long life and which leave their imprint on the physiognomy and even on the composition of the forest for ever afterwards. Just as the snowbreak recorded earlier in this paragraph will have a permanent effect on the beech-forest stands between Hanmer and Reefton, so the drought will have its long-term effects on the forests of the north. It is only by thus recording the lean years as they occur that the forests of the fat years can be understood.

What was probably the most extraordinary and unsuspected phenomenon of all came to light when fire-fighting activity and anxiety had died down and the Service had returned to its normal late-autumn activity of seed-collection. Insignis pine normally carries several seasons' crops of cones unopened—indeed, it was described by the botanists and foresters of a generation ago as a species which in Nature opened its cones only under stress of fire or decay. There has never hitherto been any reasons in New Zealand to dispute this opinion, and it has always been possible to collect good seed from unopened cones at any season of the year. The seed-collectors of late March, 1946, however, found in the Rotorua district that all cones of the species had opened and shed their seed, and investigation showed that the same had occurred in eastern Hawke's Bay. To a limited extent the experience was repeated in parts of Nelson and in the stands of Canterbury Plains that had been windthrown in the preceding winter.

The episode had its economic effect, as the Service had accepted various overseas orders for nearly a ton of seed, and collecting, extraction, and packing operations had to be moved at very short notice from Rotorua to the South Island. The point, however, is of far greater general scientific interest than this mere temporary embarrassment indicates. It has already been pointed out that the season, though dry, was not one of extremely high temperatures. The difference from normal was in the prolonged spell of drought and of low relative humidities. It would appear, therefore, that for insignis pine at least, and probably for many other conifers, it is these factors rather than mere temperature which are critical for cone dehiscence.

52. *Forest Offences.*—The number of convictions for offences against the Forests Act, 1921–22, and the Forest (Fire-prevention) Regulations 1940 secured during the year were 39 (46), and the total fines, costs, and damages amounted to £886 (£622). Particulars of these offences appear in Appendix IX.

Included in the convictions are three cases of operating an engine not provided with efficient means of preventing the escape of dangerous sparks, &c., twenty-two of unlawfully entering or hunting in a State forest, and seven of unlawfully cutting and removing forest produce from a State forest. In the seven last-mentioned cases the fines, costs, and damages amounted to £535. Other important convictions secured were two of failure to report or to fight a fire in a State forest or leaving a fire before it was suppressed, and one of failure to comply when a request was made by a Forest Officer for assistance in extinguishing a fire. Offences of this nature are very difficult to detect or enforce, and a serious view is taken of them, as prompt attention to fires in their incipient stages will often prevent extensive and sometimes incalculable damage.

Besides these convictions, the Service was also successful in securing a verdict in its favour in a case concerning a number of posts that had been seized and branded under section 53 of the Forests Act on suspicion of having been unlawfully taken from a State forest.