

*cunninghamii* is plentiful and *Weinmannia racemosa* common. The undergrowth has the general features of that of the Opawa Bush, previously described and calls for no additional comment.

Red beech forest here is distinguished by the comparative importance of *Weinmannia*, which is absent further south and sporadic to the north, and of *Podocarpus hallii*, thinly scattered elsewhere except in the *Libocedrus* association of the extreme south-west. Particularly in the Waiotaka and Whiti-kau Valleys *Weinmannia* occasionally dominates while large trees of both species with *Podocarpus hallii* sometimes approaching a diameter of 7ft are a feature. *P. ferrugineus* is frequent in the lower part of the belt. Undergrowth is generally sparse, though this may be due to deer. *Blechnum discolor* is plentiful in limited areas, but both it and the infrequent *Dicksonia lanata* appear to be restricted to drier situations as in the Northern Kaimanawa.

Mountain beech is the sole dominant in the upper forest belt. *Phyllocladus alpinus* is plentiful, also *Hebe corriganii*, *Coprosma pseudocuneata* and several other less palatable *Coprosmas*. The presence of *C. banksii* should be noted as this species in the Ruahine and Tararua Ranges has a distinct eastern-side distribution. A sprawling 8–10ft podocarp, intermediate in form between *Podocarpus hallii* and *P. nivalis* which is characteristic of the upper mountain beech forest becomes frequent. At the timberline *Phyllocladus alpinus* may form a narrow belt characteristically associated with *Dacrydium bidwillii* here either as a shrub or, more frequently, as a small tree.

(2) WAIPAKIHI FOREST. Silver beech reappears in the lower Waipakihi Valley largely replacing red beech, but its regeneration is confined to river terraces and it appears to be a relic forest in course of being replaced by mountain beech above 3,300ft and rather more doubtfully by red beech below this level. It is an isolated pocket, the nearest occurrence being across the Rangipo Desert on Pihanga and the slopes of Ruapehu.

Mountain beech is the sole dominant above 3,600ft, but a peculiarity of all types of forest here is the openness of the canopy and the density of an undergrowth of *Hebe corriganii* and enormous thickets of lawyer (*Rubus cissoides*). In consequence beech regeneration is sporadic and mainly on exposed spurs, appearing inadequate to perpetuate forest at the present day.

This unusual undergrowth suggests a succession following a widespread opening of the canopy, but it was already well developed as far back as 1933 and has shown no great development since, unless perhaps a progressive opening of the canopy. The cause is problematical on present evidence. There is some wind-throw, but certainly not on a scale that would indicate damage due to an exceptional gale. Had the canopy been opened by gale, epidemic or drought, dense beech regeneration could have been expected. An early concentration of deer preventing beech regeneration until unpalatable undergrowth had taken charge is a possibility, but this would need to have occurred well before the peak population was reached in the range as a whole.

*Podocarpus hallii* is common but only below the mountain beech belt, in which the shrubby *Podocarpus* is frequent. *Phyllocladus alpinus* frequently dominates both the upper timberline and the margins of *Festuca*-dominated river terraces, as elsewhere associated with *Dacrydium bidwillii*. On these Waipakihi terrace margins *Pittosporum colensoi*, *Coprosma linariifolia* and *C. rugosa* and *Dracophyllum subulatum* are characteristic.

The precise boundary between the Waipakihi and Waikato forest has not been determined, but recent information from a Forest Survey field party is that the Waipakihi type of forest extends down the main Tongariro for at least two miles