

mostly tall forest, the actual undergrowth being quite hidden. Thus there is the appearance of one forest super-imposed upon another. The ratas, of a rich and dark but vivid green, likewise raised above the remaining forest-trees, are extremely conspicuous. The tarairis are marked by their greyer colour and denser heads of foliage.

Outside the forest, as the leading constituent of the adjoining heath, is the bright yellow-green of the juvenile much-leafy *Weinmannia sylvicola*.

It is a truly magnificent spectacle, this great forest-mass of virgin vegetation.

(b.) *The Kauri Sub-association.* (Photo 17.)

(1.) *Its Distribution.*—A view from some point of vantage such as mentioned above shows that the chief kauri-mass extends in a broken belt from about south-east to west. On the central ridges or the hills between the two main tributaries of the Waipoua groves and clumps of kauri are scattered over the whole. The tree in question also ascends to the top of Pukehurehu, but is thickest on the lower ground. There is also a considerable amount of kauri on the Crown land, Block No. 7, lying to the south of the hill just mentioned, while across the Merowharara Stream there is still abundance of the tree. The most easterly occurrence in any quantity is up the valley, and the slopes leading thereto, of the Toronui, although a few isolated trees occur still further to the east, one example being present near the waterfall of the Waipoua River not far from the Opanake Road. By far the most important mass of kauri occurs on the high ground between Omaia and the Huaki. Here, over large areas the kauri is easily the dominant tree, and, according to Mr. Maxwell, the caretaker of the forest, this piece of forest quite equals any that he has been connected with during his experience of many years in the Hokianga district. Finally, the north-western portion in the neighbourhood of the River Wairau contains a good many trees, and it is these and the ones near the Huaki which have been especially damaged by the gum-climbers.

(2.) *Its Members.*—Few plant-associations are better defined than that of the kauri. No matter where found, the following species are almost certain to be present: The kauri (*Agathis australis*), the maireire (*Phebalium nudum*), the kauri-grass (*Astelia trinervia*), the giant cutting-sedge (*Gahnia xanthocarpa*), the white forest-groundsel (*Senecio Kirkii*), the hoihoi (*Alseuosmia macrophylla*), the neinei (*Dracophyllum latifolium*), the silver tree-fern (*Cyathea dealbata*), the miniature tree-fern (*Blechnum Frazeri*) (Photo 8), the climbing hard fern (*Blechnum filiforme*), the hangchange (*Geniostoma ligustrifolium*), the kiekie (*Freycinetia Banksii*), the large-leaved climbing rata (*Metrosideros florida*), the New Zealand sandalwood (*Fusanus Cunninghamii*), and juvenile plants of the following: the kohekohe (*Dysoxylum spectabile*), the tarairi (*Beilschmiedia tarairi*), the towai (*Weinmannia sylvicola*).

(3.) *Its Physiognomy* (Photos 9 and 10).—This association owes its striking physiognomy in part to the form of the kauri-tree itself and in part to the dense and tall thickets made by the tussocks of the kauri-grass (*Astelia trinervia*) and of *Gahnia xanthocarpa*, through or near which grow various rather straggling and usually but little-branched young trees and shrubs. These thickets are not always present to any marked degree, for where the kauri association spreads over a wide area they are absent in places, and the giant trees alone control the scene. Thus in the neighbourhood of the Huaki the great trunks, there usually of a reddish-brown colour, though elsewhere of a shining grey, rise up as bare and massive columns, 5 ft. or 6 ft. in diameter, for 50 ft., and frequently more, without a branch as far as the eye can pierce through the subdued light. Close at hand the bark, scaling off in large hard flakes, is plainly to be seen, and also the numerous ripple-like marks on the trunk (Photo 11). Round the base of each tree has collected a great mound of humus formed from the decaying bark, called *pukahukahu* by the Maoris, and which is frequently occupied by various plants, especially *Astelia trinervia*, the liane *Metrosideros florida*, and the forest-groundsel (*Senecio Kirkii*). Such mounds are 5 ft. or 6 ft. high, and of a pyramidal shape. Large roots from the kauri ramify through them. The whole is a rather moist, chocolate-coloured humus, containing much vegetable matter not altogether decayed. There is frequently here no close undergrowth to hide the view, but between the massive trunks are multitudes of straight, bare, slender stems of the tarairi, rising up parallel with one another for the most part, and thrusting their sparse heads of greenery to the branches of the kauris. Here, too, are the larger and more irregular trunks of the tawa (*Beilschmiedia tawa*), some 20 in. in diameter, these more richly covered with green and yellowish-green mosses and liverworts, or with sheets of the epiphytic fern *Polypodium Dictyopteris*, of a bright-green colour, its fronds in little tufts of five or six together, 7 in. long by $\frac{1}{2}$ in. broad, and arching slightly at right angles to the tree-trunk.

A more extended view shows that the number of species is not so limited as at first appears. The feathery fronds of the silver tree-fern (*Cyathea dealbata*), pale but shining green above, and bright silvery beneath, on trunks only a few feet tall, are dotted here and there. Juvenile plants of the towai (*Weinmannia sylvicola*), 4 ft. or so in height, and conspicuous through their large, pale, yellow-green, pinnate leaves, are in abundance. Here, too, are the fern-like juvenile miro (*Podocarpus ferrugineus*); the slender trunks of the kohekohe (*Dysoxylum spectabile*), 12 ft. or so tall, unbranched, and furnished in their upper part with great glossy green leaves, borne horizontally on long stout stalks; *Alseuosmia macrophylla*, its fine yellow flowers filling the air with fragrance in their season; the horopito (*Drimys axillaris*), with its slender, erect, black stems, and head of glossy dark-green leaves; colonies of the miniature tree-fern *Blechnum Frazeri*, 2 ft. or 3 ft. tall, its dark-green leaves semi-erect; the small tree-fern *Dicksonia lanata*, its short trunk perhaps 15 in. tall and 4 in. in diameter, and the green fronds arching outwards from their blackish stems, which shine with a metallic lustre. On the ground itself trail naked, stout stems of the kiekie (*Freycinetia Banksii*), the large tufts of rich dark-green leaves frequently blotched with yellow and having pale nerves—rising to a height of some 22 in. Here, too, but prostrate, is the climbing fern *Lygodium articulatum*, or it may frequently wind its very slender, wiry,