

(c.) *Gahnia Swamp.*

The chief example of this is the Ngaruku Swamp. Owing to the very wet season there was too much water for an examination of the most typical part of the swamp; my notes, which follow, refer only to the vicinity of its margin:—

"The swamp here should be called rather semi-swamp, and I doubt much if water lies in any considerable quantity during the summer, but now pools lie all over the track, and the amount of mud is indescribable.

"The tall trees are distantly scattered here and there. *Dacrydium cupressinum* is the most abundant, but the whole expanse of sky is everywhere visible, the tall trees offering no obstruction to the light. Besides the rimu are *Podocarpus dacrydioides*, *P. totara*, *Weinmannia sylvicola*, *Beilschmiedia tawa*.

"The chief physiognomic plant is *Gahnia xanthocarpa*, the tussocks, individually of great size, touching, and rising high above one's head. With this is plenty of immense *Blechnum capense*, *Freycinetia Banksii*, and *Dicksonia squarrosa*. *Rubus schmidelioides*, as a low bushy liane, scrambles over the young trees in many places, and there is at times a good deal of *Rhipogonum scandens*.

"Out of the tussocks rise, dotted and not forming thickets, many saplings to a height of five or six feet above the tussock, especially the graceful yellow-leaved young *Quintinia serrata* and *Ixerba brexioides*, also *Nothopanax arboreum* and *Coprosma robusta*, all these having slender stems. The ground itself is most uneven. Everywhere are horizontal roots and fallen trunks. Other small trees which are abundant are *Pseudopanax crassifolium*, *Weinmannia sylvicola*, and near the edge of the semi-swamp, *Leptospermum scoparium*. Where not so wet numerous kauris are associated with the rimu, and then more of the ordinary kauri association appears. Even in wet places there is a quantity of *Blechnum Frazeri*, and at times the kauris themselves grow right in the wet ground. As for the general physiognomy, the eye meets tussock-tops and the distant slender young trees rising out of the lower density. Above the whole are kauris 100 ft. tall, but these are not in the swamp. Also here are *Dicksonia squarrosa*, *Coprosma robusta*, plenty of *Blechnum capense*, and abundance of *Rubus schmidelioides*."

The swamp to the south of Omaia Hill contains but few trees. It is one close mass of extremely tall *Gahnia* tussock, mixed with a very great quantity of *Blechnum capense*, the leaves of immense size, *Pittosporum tenuifolium*, *Styphelia fasciculata*, *Weinmannia sylvicola*, *Nothopanax arboreum*.

(d.) *River-flats, &c.*

These belong rather to the general forest than to the swamp, and their vegetation is connected therewith by intermediates according to the gradually decreasing wetness of the ground. Where the ground is wettest the trees are of low stature, or there may be a shrubby growth only. The pukatea (*Laurelia novae-zelandiae*), marked by its far-spreading roots, buttressed trunk, and shining green, simple, toothed leaves, is common. Palms, quite without trunks but with leaves 5 ft. long or more, held in a semi-erect position, may be numerous. *Dryopteris pennigera*, with its bright-green and rather thin fronds raised high on slender trunks, which may be 3 ft. tall and 2½ in. in diameter, will be abundant, and the pale *Schefflera digitata* is an extremely common shrub. Where specially damp the far-creeping *Elatostemma rugosum* will cover the ground for many square yards, the succulent stems, bearing the bronzy-coloured leaves, rising up to quite 3 ft. in some places, while the *Dryopteris* and *Dicksonia squarrosa* grow out from the mass. *Rubus schmidelioides* will creep in abundance over the floor, but in the juvenile form only, and present also may be *Asplenium bulbiferum*, with small plants on the leaves; *Melicytus ramiflorus*; *Coprosma grandifolia*; *Nothopanax arboreum*; *Myrtus bullata*; and *Dysoxylum spectabile*, most of which are not specially plants of wet ground. The supplejack (*Rhipogonum*) is also a very frequent plant of the wet gullies. Finally, large clumps of *Hymenophyllum demissum* may be on the wet ground.

The change of the vegetation from the wet to the dry ground in some places is most striking. Thus in a piece of forest south-west of Pukehurehu is a piece of flattish swampy ground where water lies, and *Rhipogonum* and *Freycinetia* make an impenetrable tangle, *Eugenia maire* growing through them. But, closely adjoining, where the ground is dry, the tarairi is dominant, and there are many young palms and much *Blechnum Frazeri*.

## 6. THE TRANSITION FOREST.

In many parts of the Waipoua Forest where it adjoins the "heath," its character altogether changes, certain of the heath-plants entering in, other ordinary members of the forest being absent, and others, again, increasing in numbers and assuming a prominence unknown in the tarairi or other associations. This forest is important, not merely as another combination of species, but from it some evidence may be gathered as to the history of kauri forests in general. The most interesting piece of this association examined was some short distance without the reserve, but it seems well to describe it notwithstanding. The forest in question consists of closely growing slender trees, with small heads, of *Weinmannia sylvicola*, together with an equal quantity of similarly slender *Leptospermum scoparium* and an undergrowth of *Lycopodium densum*, *Blechnum Frazeri*, seedling totara and rimu, *Senecio Kirkii*, *Astelia trinervia*, some *Cyathea dealbata* and *Blechnum discolor*, *Rubus schmidelioides*, young *Podocarpus ferrugineus*, *Styphelia fasciculata*. *Lycopodium densum* is dominant as the floor-plant, but in some places is a close mass of *Blechnum Frazeri*. One plant was noted of *Metrosideros robusta*, 6 ft. tall and on its own roots.

A similar association had the trees 25 ft. to 30 ft. tall. Besides the *Weinmannia* and *Leptospermum*, was *Knightia excelsa*. The other plants were much the same as above, but there was