

Cyathea dealbata. The surface of the ground is quite uneven owing in part to low, creeping roots, and in greater measure to stones and fallen logs, all of which being moss- and fern-covered affect the physiognomy of the forest. *Metrosideros hypericifolia* also, as so frequently elsewhere, creeps over the ground. As for the crowns of the trees, these do not touch, and the upper covering is thus quite open. The trees here, as listed, are *Dacrydium cupressinum* here and there, *Beilschmiedia tawa*, *Weinmannia sylvicola*, and also *Rhipogonum*, young *Laurelia*, and an occasional *Styphelia fasciculata*. *Hymenophyllum dilatatum* hangs from trees, &c., as usual, and there are plenty of mosses. A pale-green filiform liverwort is at times conspicuous, and there are plenty of the tall leafy forms. *Astelia Solandri* is plentiful in the trees, and it is also frequent on fallen logs. Where most open there is *Microlaena* in abundance, and then only young trees—e.g., *Weinmannia*, *Suttonia salicina*, and *Blechnum Frazeri* and *Freycinetia*. In such open spaces the latter, man-high, may exclude all else. Also here and there is almost an open sky. . . . Another natural opening has *Freycinetia* dominant in some places and *Microlaena* in others, and there are shrubs and small trees, &c.—e.g., *Weinmannia*, *Beilschmiedia tawa*, *Dicksonia squarrosa*, *Podocarpus ferrugineus*, *Rapanea salicina*, *Dracophyllum latifolium*, *Freycinetia*, *Blechnum Frazeri*, *Lygodium*, *Metrosideros florida* on the ground, and *Styphelia*. The adjacent forest contains a good deal of *Dacrydium cupressinum* and *Metrosideros robusta*, but their boughs do not meet."

5. ASSOCIATIONS OF WET GROUND AND SWAMPS. (Photo 15.)

(a.) General Remarks.

Wherever the drainage is defective the ground remains permanently wet, while in no few cases pools of water lie on the surface. Such places, it can be well understood, support a special plant population, the leading members of which, if not absolutely confined to such ground, exist there in greater luxuriance and numbers than elsewhere. Gullies and river-flats also are frequently much wetter than the average forest, and here, too, certain plants, rare or absent elsewhere, occur. The following are the principal swamp or wet-ground species, some of which, however, as may be seen from what has gone before, are quite common in the ordinary forest:—

Filices: *Blechnum capense*, *Dryopteris pennigera*, *Dicksonia squarrosa*.

Taxaceae: *Podocarpus dacrydioides*.

Pandanaceae: *Freycinetia Banksii*.

Urticaceae: *Elatastemma rugosum*.

Monimiaceae: *Laurelia novae-zelandiae*.

Rosaceae: *Rubus schmidelioides*.

Myrtaceae: *Eugenia maire*.

Rubiaceae: *Coprosma tenuicaulis*.

The only swamps of importance are the Ngaruku, north of the Kohuroa Heath, a smaller one south of Omaiā, several wet flats along the River Waipoua, and certain small pieces on the high land of the east. The swamps naturally fall into two categories—(1) those in which the kahikatea (*Podocarpus dacrydioides*) is the dominant member, and which is in miniature identical with the similar formation so extensive along the Kaipara Harbour and elsewhere; and (2) those where *Gahnia* and *Freycinetia* are dominant, arborescent plants playing a very secondary part. Finally there are the moist river-flats and gullies, these rather a part of the tarairi or tawa-tawai associations than of the swamp.

(b.) The Kahikatea Association.

The ground is excessively wet, pools of water occurring everywhere, so deep in places as to take one up to the knee. Fallen trees lie on the ground, and along these is the only comfortable but slow method of progression. *Podocarpus dacrydioides*, with slender mast-like trunk 80 ft to 100 ft. tall, and slender fastigiate heads, rise up on all sides, but not close together as in a typical kahikatea forest. Rather than the trees is the undergrowth the main feature. This consists of a tangle of the kiekie (*Freycinetia*) on the ground and climbing the trees and shrubs. Everywhere, but not close, are slender-stemmed plants of the maire-tawake (*Eugenia maire*). The piu (*Blechnum capense*), its fronds four or five feet long and close together, forms thickets. Fair-sized plants of the slender tree-fern *Dicksonia squarrosa* are in groups or singly here and there. *Dryopteris pennigera*, here with a slender trunk 3 ft. or so tall and elegant green fronds, is common. The thin-leaved juvenile form of the rose-leaved bush-lawyer (*Rubus schmidelioides*) creeps over the wet ground or climbs up the tree-fern trunks, as also does the lobed-leaved form of *Muehlenbeckia complexa*. The black stems of the supplejack (*Rhipogonum scandens*) are much in evidence, rising out of the water and forming entanglements. Finally, there is abundance of juvenile *Weinmannia sylvicola*, distinguished here as elsewhere by its pale yellow-green leaves.

The swamp forest of the uplands near the Opanake Road is somewhat different. Here *Laurelia novae-zelandiae* is abundant, and at times it forms considerable colonies to the exclusion of all other trees. There is abundance of the reddish and thin-leaved *Eugenia maire*. *Rhipogonum* and *Freycinetia* form the usual entanglements. *Podocarpus dacrydioides* is present in quantity in some places, while the small-leaved, slender-twigged *Coprosma tenuicaulis*, a shrub of graceful habit, and the shining green-leaved broadleaf (*Griselinia littoralis*) are plentiful, growing in the wettest ground.

Blechnum capense and *Dryopteris pennigera* are common in many places. *Weinmannia sylvicola*, *Coprosma grandifolia*, and *Fuchsia excortica* grow mixed with the other plants. Finally, the tree-ferns *Hemitelia Smithii* and *Dicksonia squarrosa*, this last the more abundant, are present.