

The juvenile plant is distinct from the adult, being pyramidal-shaped, the lateral branches given off at right angles, pendulous, and covered with leaves larger than those of the adult.

The kahikatea (*Podocarpus dacrydioides*) is a lofty forest-tree with a rather slender, mast-like, quite unbranched trunk for about its lower seven-eighths, and having a most scanty and rather fastigate-shaped head quite out of proportion to the size of the tree. The leaves are dimorphic, those of the adult being inserted in a spiral, imbricated and adpressed to the stem, subulate-lanceolate and $\frac{1}{2}$ in. to $\frac{1}{4}$ in. long, while the juvenile are distichous, flat, linear, $\frac{1}{2}$ in. to $\frac{1}{4}$ in. long, and dull-green, reddish, or at times almost bronze-coloured. The juvenile form is shrubby, with long, spreading, slender, more or less horizontal twiggy branches, much exceeding in length the height of the plant. From its main stem very short shoots are given off most closely.

The giant cutting-sedge (*Gahnia xanthocarpa*) is a very stout sedge, forming enormous tussocks 8 ft. to 12 ft. tall. The leaves are erect or semi-erect, $\frac{1}{2}$ in. broad or more, involute, scabrid on their margins, glossy but rather dark-green, coriaceous, and moderately stiff. The old leaves rot away and leave many persistent, decaying, and usually wet leaf-bases.

The kauri-grass (*Astelia trinervia*) forms very large tussocks made up of numerous leaves 5 ft. to 7 ft. long by $1\frac{1}{2}$ in. broad, tapering into a long-drawn-out point, and expanded below into a broad, fleshy, sheathing base clothed with long white hairs. They are pale-green, coriaceous, glabrous above, covered beneath with a silvery pellicle. The flowers are small and dioecious, the berry $\frac{1}{2}$ in. in diameter and bright-red.

The towai (*Weinmannia sylvicola*) is a moderate-sized evergreen tree of the forest, but merely a shrub of the heath. The trunk, often irregular in form, is from 1 ft. to 3 ft. in diameter. The leaves are dimorphic; the adult are entire, ternate or pinnate, with two or more lateral leaflets, rather dark shining green, with at times a yellow tinge, moderately thick, pale on the under-surface. The juvenile plant is treated of in the section dealing with the ecology. The flowers are small, very numerous, white or pale-rose, and in terminal or axillary racemes.

The parataniwha (*Elatostemma rugosum*) is a prostrate, stout, herbaceous plant, with very long, branching, somewhat rigid, terete, juicy, pale yellowish-green stems, $\frac{3}{4}$ in. in diameter, which branch abundantly, and give off distant, rather stout, cord-like roots, 10 in. long or less. The stems ascend at their apical portion, and give off on their flanks large, thin, pale yellowish-green, lanceolate serrate leaves, 3 in. to 10 in. long. The flowers are very minute, on fleshy, monœcious receptacles of a pinkish colour, in the axis of the leaf.

The silver tree-fern (*Cyathea dealbata*) has a stout trunk 30 ft. tall at most, strongly thickened by vertically descending, dark chestnut-brown, aerial roots. It is much expanded at the base, where it may be 18 in. or more in diameter, clothed to its middle or below with leaf-bases each 3 in. or 4 in. long, and bears at its summit numerous very large, feathery, horizontal leaves, light-green above and covered beneath with a white powder, each 5 ft. to 12 ft. long or more and 2 ft. or 3 ft. broad, spreading out radially from the trunk and arching a little downwards, and with a distinct umbrella-like appearance.

The woolly tree-fern (*Dicksonia lanata*) is a small tree-fern with a trunk almost unnoticeable, or reaching a height of 6 ft. or more, dark-brown in colour near its base, and there covered with aerial roots. The sterile fronds, shining dark-green, are 5 ft. in length, more or less, coriaceous and moderately thick, and spread out semi-horizontally. The fertile fronds, on the contrary, are bright-green with a yellow tinge, and raised conspicuously above the unfertile.

Besides the above plants, others, such as *Polypodium Dictyopteris*; filmy ferns of various species; the epiphyte, *Astelia Solandri* (Photo 5); *Pittosporum tenuifolium*; *Coprosma grandifolia*; the kohekohe (*Dysoxylum spectabile*); the pukatea (*Laurelia novæ-zelandiæ*), play at times an important part in the physiognomy of the forest, but such and other plants of local physiognomic importance are dealt with further on in describing the various associations, or in the part relating to the ecology.

3. THE KAURI-TARAIRI ASSOCIATION.

(a.) General Remarks.

This consists of two sub-associations, the tarairi and the kauri, which, although forming one compact whole, are generally distinct from each other, the kauri being in most instances accompanied by certain definite species, and this even when a tree stands isolated and the tarairi is present in abundance on all sides. This association occupies all the country to the west of the Toetohatiko ridge, excepting where the ground is too wet, though in some places other trees than the kauri—e.g., *Beilschmiedia tawa*, *Weinmannia sylvicola*, *Dacrydium cupressinum*—enter in and become dominant over small areas. A most excellent view of this part of the reserve may be obtained from the high ground along the Merowharara-Katui Track, the forest lying extended over the ridges and valleys as a dark and somewhat gloomy mass fading into blue in the distance. The great area of the whole detracts considerably from the height of the constituent species. Dead trees stand out here and there near the outskirts. The kauris rise high (Photo 7) above the other members of the forest, isolated or in groups, each tree-crown distinct, or occasionally these are quite close. Seen from a short distance their colour is dull olive-green or brown, but from further away the distinguishing hues of the various members are lost. The adjacent forest lying in the hollow below is very beautiful. The roof is quite uneven owing to the different heights of the trees. Young upright-growing kauris are in plenty, fringing the margin, and their colour is not uniform. Some are green; others are of a darker shade with a bluish tinge, and these latter are especially handsome. The older kauris, distinguished by their branching—so different, as already pointed out, from that of the juvenile form—are very conspicuous. They rise up above the general mass just as does an ordinary forest from the under-scrub, which in this case is itself