

leaves are of the ovate type, deeply serrate, 1 in. or more long, bright-green, glabrous, and rather thin. The flowers are monœcious.

*Nothofagus Menziesii* (silver-beech) (Photo. No. 14) is a tall evergreen forest-tree with a straight trunk, not so thick usually as that of *N. fusca*, covered with smooth silvery bark when young, but, when old, furrowed and flaking. The branches are spreading when growing in the open, but in the forest the habit is more fastigate. Quite short branches are frequently given off from the trunk close to the ground. The final branchlets are stiff and slender, and bear on their flanks numerous shorter leafy twigs, which again branch, the whole forming a flat fan-shaped closely-leafy mass. The leaves are small, bright-green, and shining, but rather yellowish in the mass and not vivid green as those of *N. fusca*, coriaceous, and of broadly ovate type. The ultimate branches are clothed with brown pubescence. On the under-surface of the leaf, especially near the base, are fringed domatia.

#### (2.) Shrubs.

*Coprosma foetidissima* (stinkwood) is a rather moderate-sized evergreen shrub, made up of a few slender arching stems, leafless and unbranched below, sparingly branched above, and bearing rather pale green, subcoriaceous leaves of the oblong type, one or two inches in length, and emitting a foetid odour when bruised. The flowers are diœcious. The drupes are produced in abundance, and are conspicuous through their orange colour.

*Coprosma tenuifolia* has very much the same habit as *C. foetidissima*. There is a slender arching main stem or stems covered with smooth grey bark, and furnished with a few long branches which give off from their flanks rather distant, opposite, slender, brittle twigs, which branch in similar manner once or twice into very short twigs provided with moderate-sized, shining, rather thin, ovate, acute leaves of a dark or yellowish-green colour, their veins marked with dark-green and the under-surface quite pale.

*Suttonia divaricata* (weeping matipo) is a moderate-sized shrub with an extremely dense habit of growth after the manner of certain species of *Coprosma*. Its branches are slender, stiff, wiry, divaricating, and much interlaced. The leaves are small, of obcordate type, rather pale-coloured, coriaceous, and glabrous. The flowers are minute, and the drupe purple and fleshy.

*Nothopanax simplex* is a tall shrub or small tree with a short trunk or trunks, which give off numerous semi-erect slender branches, so that a tree of considerable diameter and thicket-like growth results. The leaves show a remarkable heterophylly, which is dealt with further on, and the adult leaves are simple, of lanceolate type, three or four inches long, glossy, coriaceous, and dark-green. The umbels are small, and the flowers are inconspicuous and greenish-white in colour.

*Nothopanax Colensoi* (ivy-tree) is an evergreen shrub, with unbranched naked stems of bamboo-like form, marked at irregular intervals of 2 in. or less with pale-coloured leaf-scars, which contrast with the brownish-green smooth bark. Short branches are given off near the ends of these stems, bearing the thick, dark-green, shining, glossy, coriaceous, large, digitate leaves on long stout petioles. The flowers are diœcious, arranged in large umbels, and rather conspicuous through their number.

*Phyllocladus alpinus* (mountain-toatoa) is dealt with further on in the section on the sub-alpine scrub.

#### (3.) Herbs.

*Lagenophora petiolata*, although an insignificant plant, occurs in such considerable quantities on the floor of the mountain-beech forest that it demands mention here. It is a small creeping herb, spreading by means of rooting, and branching slender pale-coloured stolons into wide mats. The leaves are of orbicular type, coarsely toothed, dull-green, frequently purple on under-surface, thin, and with long slender petioles. The flower-heads are small, daisy-like, white, and raised high above the foliage on straight slender stalks 5 in. and more in length. Very frequently the ray florets are curled up.

#### (4.) Ferns.

*Hymenophyllum multifidum* is a filmy fern which forms extensive mats upon the ground or the tree-trunks, spreading far by means of its wiry, creeping rhizome. The fronds are 4 in. or 5 in. tall, or sometimes more, very thin and translucent, and vary from a dark to a light green.

*Blechnum penna marina* forms large colonies, spreading by means of the long, branching, creeping rhizome, which gives off the fronds in tufts. These are dimorphic, the sterile are narrow, lanceolate, almost pinnate, dark-green, coriaceous, and semi-erect, and the fertile are longer and narrower, of a brown colour, and with the segments much narrower than those of the sterile fronds.

*Polystichum vestitum* does not usually on the volcanic plateau show a trunk-development to any marked extent, as in many subalpine forests and in the subantarctic islands of New Zealand. It is a tall fern, with numerous spreading and arching fronds, which are 3 ft. to 5 ft. long, with a stout stalk densely clothed with dark-coloured scales, and lanceolate, dark-green, subcoriaceous, rather stiff blades.

#### (c.) ECOLOGY.

The subalpine forest of the mountain-beech (*Nothofagus cliffortioides*) may perhaps be designated subxerophytic. It is true that Schimper (39) classified it as tropophytic, but this was probably to place it in the same category as the closely related deciduous beech forests of Fuegia rather than from any special character of the leading tree. This has small though numerous coriaceous leaves, hairy beneath, which are in part cast off yearly, young bright-green leaves appearing in the spring and giving a distinct and pleasing appearance to the landscape at that season. Also, a prolonged period of drought will bring about the leaf-fall. Thus, while camped in the forest near the Ruapehu Mountain House, the leaves during late February and early March