Leaving out of the question the so-called variety *parvum*, there is only one form of adult, so there can be no question of two very similar species with a different life-history. Also, the toothed-leaved form is almost the exclusive one of the Auckland Islands, and was considered the only one of that region until my finding a cut-leaved example there in 1903. The adult tree has finally simple leaves, but with these are mixed both forms of the juvenile, the cut-leaved more sparingly than the other. Occasionally plants occur where cut-leaved shoots bloom. Also, these juvenile reversion-shoots are not confined to the base of the tree, as is so often the case of this class of phenomena, but occur also on the ultimate branches. Even with moist-air culture the toothed-leaved seedling, so far as my experiments of some years' duration go, will not grow into the cut-leaved form. That there was originally some connection between a hygrophytic station and the cut leaves there seems little doubt, the above experiments notwithstanding, especially when it is remembered that the more hygrophytic the forest the more luxuriant is the cut-leaved stage. But at the present time environment appears to have no influence, and *the dual forms must be considered no longer as adaptations, but merely as survivals from previous climatic conditions*, whereas in *Aristotelia fruticosa* cited above the various stages are still dependent to some extent on external influences, and the characters are not thoroughly fixed.

With the exception of the scrambler *Rubus australis*, woody lianes are absent. Nor, with the exception of some *Polypodium diversifolium* and *P. novæ-zealandiæ* in the west and south, are there climbing ferns. In the same region a few plants of *Astelia Cunninghamii* ascend to the upper forest, otherwise spermaphytic epiphytes are absent.

Parasites are represented by *Elytranthe tetrapetala*, which forms bushes on *Nothofagus; E. flavida*, which is confined, so far as I know, to *N. cliffortioides*; and the curious orchidaceous so-called root-parasite *Gastrodia Cunninghamii*, which is quite abundant in the forests of the east. The loranthads have plenty of chlorophyll in their leaves, and are therefore hemi-parasites. *Gastrodia* has a thick, fleshy, easily broken root a foot or more in length, full of starch, from which issues a brown-coloured, leafless stem, 1 ft. to 2 ft. tall, marked with darker spots, and which produces a raceme of brownish flowers in January. Personally, I have never traced the root to its attachment with the host, so can say nothing on this head, and consider the plant is probably a saprophyte.

(*d.*) Subalpine Beech Forest of Nothofagus cliffortioides.

(1.) *Distribution.*

This is the forest of the highest altitude and of the most exposed position. On the southern and western sides of Ruapehu it forms a continuous belt from about an altitude of 3,700 ft. to 4,000 ft., while on the eastern side of the volcanic mountains there is no such continuous zone, but merely a number of isolated patches, the largest, some hundreds of acres in extent, near the junction of the north and south branches of the Waihohonu River. On the east side of Tama is a fairly large piece of this formation, and there are one or two extremely small patches on the north-eastern spurs of Ruapehu, these and that of Tama marking the tree-limit on the east of the volcanic chain at about an altitude of 4,100 ft. Also, further to the south, beyond the gorge of the Wangaehu, are two pieces of this formation, one bearing the name of the "Round Bush."

(2.) *Physiognomy.*

The general appearance from without of the formation under consideration is that of a dense, and black, gloomy-looking, uniform mass of trees (Photo. No. 15). A nearer view yields a more pleasing sight. The trees, fairly close together, are well branched, the foliage verdant and healthy, while on their outskirts or just beneath their shade are certain invaders from the shrub-steppe —*e.g.*, numerous rounded bushes of the bright-green *Veronica lævis*, rather showy when, in early February, covered with close masses of white or lilac blossoms; taller and many-branched dark-green shrubs of *Dacrydium Bidwillii*, of a cypress-like habit; and the pale-"leafed" toatoa (*Phyllocladus alpinus*). Within the forest there is often not much undergrowth. Where the trees are young they are quite close, and little is seen but their slender, bare, straight, greyish stems, the rather dense foliage above, and, on the floor, many brown dead leaves and branches; while here and there are a few seedlings of the ordinary forest-shrubs enumerated further on. Such saplings may be from 2 in. to 4 in. in diameter, and from a foot to a yard apart. In other places the old trees are the most abundant, and tree-trunks, their bases hidden by shrubby undergrowth, catch the eye everywhere, but from the sapling forest to the adult are transitions of all kinds. In a fully matured portion the trees may be as much as 60 ft. tall and 2 ft. in diameter, but usually the dimensions are less. The trees are often a considerable distance apart. Their branches are much less spreading than those of the forest-outskirts; the trunks are straight and covered with moderately smooth bark, on which a few species of mosses form mats or cushions. Foliaceous lichens of the genus *Sticta* are also common, while a white, thin, crustaceous lichen pressed closely to the bark very frequently gives a characteristic colour to the trunk. The roof of the forest is not a continuous close covering; light penetrates everywhere, but its intensity is least where the saplings are especially dense

Beneath the trees the undergrowth is in two layers, though this arrangement is not present everywhere—a layer of shrubs, low trees, and young beech-trees, and the actual close covering of the forest-floor.

The shrubby layer is rarely sufficiently dense to offer many obstacles to the intruder. It consists of the sparsely branched pale-green *Coprosma fœtidissima*, its height reduced through its drooping habit; the large, taller, and much more bushy *Nothopanax simplex*, which is frequently the dominant shrub; *N. Colensoi*, with its dark-green, leathery, digitate leaves growing near the extremities of the naked bamboo-like branches; and moderate-sized shrubs or small trees of