

PART I.—INTRODUCTION.

A. GENERAL REMARKS.

Among the varied forest communities of New Zealand, that of the kauri stands supreme. This is in part because of the majestic character of the dominant tree, and in part from the great number of species therein to be found, together with their diverse systematic affinities and different forms. Strange to say, up till now no detailed account has been published of this formation. Indeed, it is not going too far to assert that the kauri forest, which for so many years has supported a most important industry, is less known to the majority of New-Zealanders than is any other indigenous tree-association. Moreover, this same forest, owing to the value of its timber and more still to the loss in the past through fires, now occupies an extremely limited area, daily becoming smaller, and so a plant-formation, one of the most rare, beautiful, and at the same time scientifically interesting to be met with, not only in New Zealand, but in the world at large, bids fair at no distant date to become altogether a thing of the past. It is true that by reading between the lines in the existing Floras and those botanical papers which deal with northern New Zealand some idea may be gathered as to the species composing such a forest, while in his fine work "The Forest Flora of New Zealand," and also in his "Report on Native Forests," Kirk devotes a few lines to its description. The most important account, however, is that of Hochstetter (14), but this is quite short and general. Finally, in general works dealing with New Zealand, short but not infrequently misleading accounts are given of kauri forests, as where, for instance, mention is made of the profusion of lianes passing from kauri-tree to kauri-tree (13). But so far as I know no attempt has been made to describe this formation, most characteristic of primeval northern New Zealand, so as to give some idea of its appearance as a forest; nor have any details whatsoever been published as to its ecology as a whole or that of its members.

A stay of some two months in the neighbourhood of a large area of virgin forest—the largest indeed now in existence—the Waipoua—enables me in this report to attempt in some degree to supply the above distinct want. Unfortunately my investigations were hindered by an abnormally wet season, notwithstanding which a portion of every day, at any rate, was passed within the forest, while its close proximity to my camp provided fresh botanical material in plenty. Especially was this wet weather adverse to photography, and in consequence numerous typical features of the formations have not received adequate representation.

The Waipoua Reserve is not an isolated patch. On the contrary, it forms part of a still extensive forest-mass extending to the north, east, and south-east, but which originally was of much greater extent, covering as it did a large part of northern Auckland with a mantle of trees.

The forests of New Zealand fall naturally into two categories—viz., those in which one tree is dominant, and those where there are numerous forest-trees together with a rich and varied undergrowth. Notwithstanding the term "kauri" as applied to the formation, this belongs to the second class, the mixed forest, its designation arising rather from the commercial value of the tree and its striking appearance than from its being dominant. On the contrary, it is unusual for large numbers of kauris to occur together, though in certain forests now destroyed this was more or less the case. Usually the tarairi is a much more abundant tree, and were dominance the only consideration the term "tarairi forest" would be more proper.

B. TOPOGRAPHY AND PHYSICAL FEATURES.

The Waipoua Forest is situated in the Hokianga County, some nine miles distant in a bee-line from Hokianga Harbour, and lies between the two small rivers Wairau and Waipoua, which form respectively its northerly and southerly boundaries, excepting two small portions which pass beyond them, one at the extreme south and the other on the north. The approximate area of the reserve is 23,000 acres. On the east it is distant only a few miles from the sea, certain portions being less than two miles, whilst on the west it ascends to the so-called table-land over which the Kaihu-Opanake coach-road winds, there reaching a height of almost 2,000 ft. The country occupied by the forest is hilly, and consists of long, mostly level-topped, ridges running usually in an easterly and westerly direction, broken by gullies, and having somewhat rounded sides, and their faces by no means steep. Many of the ridges are more than 1,000 ft. in altitude. Streams abound, and these, though usually of small dimensions, rise quickly, and soon become uncrossable. The Waipoua itself is a true mountain-torrent. On the south-west of the forest, where it passes behind the high ridge of which Toetoehatiko, 1735 ft., is the culminating point, it has cut for itself a gorge some hundreds of feet deep and having precipitous sides, and here the scenery is of a fine character. The Wairau Stream is in some places of a more sluggish nature and has deeper and muddier waters. Between the forest and the sea the country is still hilly and much broken, and in many places sand-covered, the land having evidently been much lower at one time.

The whole of the forest reserve is not occupied by trees and shrubs; certain of the summits of the ridges are open, as is also a small tract on the south-west. These open patches are of interest since they afford an example of another plant-formation of the North, the heath, which, botanically at any rate, is almost of equal interest to the kauri forest, and which, as it now occupies so much of the Auckland Provincial District, is of importance likewise from the agricultural standpoint.

As for the geology of the district I can say little. On McKay's map (23) it is marked as Tertiary, but a sample of rock collected near the Taheke Road is, according to Mr. Speight, B.Sc., to whom I submitted a specimen, an olivine basalt.

The soil varies considerably in different parts of the area, that of the river-flats being, of course, the richest, as it possesses not only its own humus, but the surface soil washed from the steep slopes. This richer soil is marked by the presence of certain trees, especially the puriri (*Vitex lucens*), which is altogether absent elsewhere. Generally speaking, the subsoil is a stiff clay with a