

predominates (Fig. 4). These groups, then, comprise essentially the primary forest, and they are of immense significance, as will appear later, in deciding the varieties of grasses and clovers that should be sown. The foregoing is an account strictly appertaining to the ancient forests, which are here termed the "primary forest."

Where there have been factors at work that have destroyed the primary forest within the last hundred years an altogether different growth has come into being, varying in its components and from the primary forest according to the longer or shorter time that has elapsed since that destruction, and according to soil and aspect. Such growth may be in the form of fern or scrub of different sorts, or it may consist of small trees. Both classes of growth must be regarded as developmental stages by which the primary forest may once more re-establish itself. To the fern and scrub may be applied the term "secondary scrub," and to the small tree associations that of "secondary forest." The primary forest is really the aged adult; the secondary scrub and the secondary forest are but phases in the life-cycle or processes of growth leading to the adult primary forest. Here, then, we find in natural vegetation, as in our grasslands, that there is succession—that is to say, there is a series of plant communities, one type by its growth preparing the way for the next, which when established will replace its foster parent. The latter in its turn will grow—it will again modify the conditions so that a still higher class of forest-growth may establish, and this, too, will ultimately be replaced by a still higher forest-form. And so the succession of forest types goes on until finally there arises an association that ceases to change. This stage is old age; it is the climax of a gradual development. It is called a "climax association." Development, of course, never stops in nature, but the change after a shorter or longer time becomes so slow that for all intents and purposes the scenes have ceased to change.

Actually it would appear that in the Whangamomona district there were only two climax trees—tawa on the slopes and kahikatea on the wetter flats. On the slopes, then, all the other primary-forest trees present would be looked upon as preparing the way for the tawa climax, and we could tentatively arrange them in the following order of development: Black-beech, totara, kamahi, rewarewa, hinau, maire, rimu, rata, tawa. The present disposition of the trees as they appear in the primary forest supports this order of development. Where there are old and often knarled totara, black-beech, rewarewa, &c., we find the undergrowth not to be young trees of these species (though some young rewarewa may establish there), but sapling tawa growing strong and vigorous (Fig. 5). We find that the rata are, in the main, well up on the ridges—the survivals, apparently, of a general rata retreat before the tawa advance. The great forest-tree that supports the rata in its juvenile stage is the rimu, and consequently it may be inferred that a rimu association preceded that of the rata, or else the rata could not have developed into the large forest-trees seen on the ridges. As far as the regeneration and development of the primary forest is concerned, the black-beech now plays no part on the lower slopes. The beech, then, would appear to be either the survival remnant of a once high-altitude forest, or else the remnant of the first forest that clothed the lowland, but which for ages has been located on