

dividing ranges of the North Island are to be found; seeds, &c., of many species having doubtless arrived which could not obtain a final footing, while others would settle down under specially favourable conditions, which in their turn a fresh eruption would remove. That this may have been so is shown by the survival at the present time of certain species in special stations, such as *Poa novæ-zealandiæ*, *Carex pyrenaica*, *Ourisia cæspitosa*, *Danthonia Cunninghamii*, &c.

The plant covering as it now exists is regulated by altitude, the nature of the soil, and the age of the surface. This the zonal distribution, although much broken, shows clearly: grass meadow, shrub-steppe, and desert occurring according to altitude, steepness of ground, and condition of surface soil. The highlands of Tongariro, with their better soil, the result of a somewhat different rock, have a richer vegetation than elsewhere. Ngauruhoe, the youngest volcano, is without plant-life except at its base.

All things considered, it is remarkable how such xerophytic conditions can support even as many species as there now are, especially when it is borne in mind that they were originally, and are now elsewhere, living for the most part under a different environment. The small number of species is due to the paucity of the North Island alpine flora rather than to the conditions offered; and, had there been a steady stream of immigration from the south during the period subsequent to the volcanoes, there would have doubtless been a more abundant flora.

This leads one up to the question of the paucity in general of the North Island alpine flora, and to me it seems perhaps to depend upon the following:—

1. The lowness of the North Island mountains, even at the time of land-connection with the South Island.

2. The small space available above the forest-line on the East Cape—Tararua Ranges.

3. The comparatively short time alpine conditions have existed in the North Island compared with the South, owing to No. 1 and the greater height of the line of arborescent vegetation.

4. The limited distribution of many South Island species owing to their local origin, through isolation, mutation, &c.

5. The birds likely to convey seeds not being usually of long flight.

6. The unsuitability of many alpine plants for wind carriage, and the small chance that even suitably equipped species have in gaining a footing in a virgin vegetation.

The presence of the South Island variety of *Pittosporum rigidum* is a matter of considerable interest. This form is distinguished from the type (a plant ranging from the East Cape mountains to the Tararuas and extending into north-west Nelson) by its fewer, smaller, and narrower leaves, reversion-shoots of a distinct form, and especially its divaricating habit of the most extreme type. This form, as I have shown elsewhere (5) and already mentioned in this report, is distinctly related to its xerophytic environment, but one which the typical form could not assume, it being, indeed, a specific character—or, rather, combination of characters—of the form under discussion. That this variety alone of all South Island plants can have arrived on the volcanic plateau by bird carriage seems almost incredible. Therefore, hard as it is to believe, there certainly seems here, if we consider this form a species, a case of one and the same species having arisen independently in two, at any rate, distinct localities from one and the same parent species (the typical *P. rigidum*), owing to analogous surroundings having either evoked the form or preserved the mutant, the conditions being the edaphic conditions of the volcanic region on the one hand and the steppe climate, together with, perhaps, also, certain edaphic conditions of the eastern South Island during the extension of the glaciers. On the other hand, the presence of *Coprosma Petriei* may, however, be urged as a proof of bird carriage being efficacious; but this latter plant was observed only by me at the south end of the plateau near the Kaimanawas, on to which it doubtless extends, while it probably also reaches further to the south and on to the lower country. At any rate, the matter of *Pittosporum rigidum* is worthy of notice, and students of the flora should watch closely for the occurrence of the South Island form on the Ruahine and Tararua Mountains.

Mount Egmont is always considered as geologically of the same age as the central volcanoes, a matter which the Maori legend also unconsciously corroborates. Its flora presents very considerable affinities to that we are considering—a remarkable fact when its isolated position is considered—but it is richer, and contains certain species absent on the volcanic mountains of the centre, such as *Epilobium chloræfolium*. *Claytonia australasica* and *Luzula Colensoi* are common scoriated plants there; as on Tongariro-Ruapehu *Danthonia Raoultii* stamps the physiognomy of its meadow or steppe; cushions of *Racomitrium lanuginosum* earn the vegetation above the scrub-line the title of “the moss,” almost as it might do on certain part of Tongariro. But these are exceptions. Especially is *Ourisia macrophylla* enormously abundant, and *Ranunculus nivicola* grows with such an extreme luxuriance as hardly to resemble the Tongariro plant. However, the subject is too large to admit further treatment. Probably the differences arose partly from the different conditions during colonisation of the new ground, and partly from the high rainfall of Egmont and the number of rainy days. Also, this latter mountain has been for a much longer period inactive, and its ground is now more suitable for plant-colonising. Finally, it must be pointed out that its flora, in any delimiting of floristic areas, must be included with that of the volcanic plateau, even though the country between the two districts is classified under another head.

VIII. THE PARK AS A NATIONAL DOMAIN.

The boundaries of the Tongariro National Park as at present constituted consist of the circumferences of three circles drawn round Tongariro, Ngauruhoe, and Ruapehu respectively, and having a radius of three miles for the two former and four miles for the last-named. These circles are joined by a neck of land two miles wide occupying the saddle between Ruapehu and the other volcanic masses.

A consideration of the purposes for which such a domain is intended shows that the above boundaries are inadequate and inconvenient. For instance, the park presents the curious anomaly of being, except for the narrow piece of forest on the north of Tongariro and one or two small patches on the spurs of Ruapehu, practically without a tree. Even the Mountain House near