

the main chain, and about 1,000 feet below the summit of the principal pass leading to the West Coast; and Queenstown, altitude 1,070 feet, on the margin of Lake Wakatipu. In this locality, the temperature is favourably influenced by the proximity of so large a body of water.

At Bealey, the mean annual temperature is $45^{\circ}76$; for the summer quarter, $54^{\circ}86$; for the winter quarter, $37^{\circ}40$. The difference between the hottest and coldest months is $18^{\circ}1$. Annual rainfall, 97^o738 inches. Prevailing winds, W., N.W.

At Queenstown, 2 degrees further south than Bealey, but 1,000 feet below it in altitude, the mean annual temperature is $51^{\circ}0$; of the summer quarter, $51^{\circ}7$; of the winter quarter, $59^{\circ}2$. The difference between the hottest and coldest months, $23^{\circ}8$. Annual rainfall, 30782 inches. Prevailing winds, N.W.

In the latitude of Bealey, the mean annual temperature of the upper limit of the *Fagus* forests may be estimated approximately at under 40° Fah.

47. The chief forests of the upland district, like those of the lowland, are found on the Western Coast, but, as might be expected, are not correspondingly developed in the extreme southern portion of the island. They are composed of the different species of *Fagus*, either singly or mixed in varying degree with scattered specimens of totara, red pine, matai, kamai, silver pine, ironwood, cedar, &c., in their lower ranges; and alpine toatoa, pokako, *Panax simplex*, and other shrubs or small trees in the upper.

In lowland forests, and especially in warm river valleys, all the beeches attain large dimensions and form noble trees; as a general rule, large trees do not occur above 2,500 feet. Miles of forest may be explored without finding a single trunk 2 feet in diameter. Even at the lower limit, it is not uncommon to find forests consisting of straight regular stems of great height, but small diameter. This is especially the case with the entire-leaved beech (*F. Solandri*), which, although ranging from the sea level to 4,500 feet, and forming the chief portion of the alpine forest of the South Island, requires shelter and good soil to enable it to attain fair dimensions.

48. The *Fagus* forest seldom attains a greater altitude than 4,500 feet, unless in a few exceptional localities in the north-western portion of the district. In Otago it rarely exceeds 3,500 feet, and more frequently runs out below 3,000 feet. In the upper part of the Buller it runs for miles in a remarkably even line, estimated at 4,300 feet. Where it runs out, the trees are sometimes reduced to shrubs a few feet in height, with disproportionately stout branches, supporting a dense growth of short interlacing spray, forming a surface sufficiently compact to walk upon.

49. Tooth-leaved beech, *Fagus fusca*, is the prevalent tree in the lower parts of the district, although it ranges from the sea level upwards. It is from 80 to 100 feet high, with a trunk 3 to 8 feet in diameter. Its spray and foliage are remarkably elegant; the leaves are membranous, prominently ribbed, and with sharply serrated edges. The bark is longitudinally fissured, and varies from black to a rich chestnut brown. In forests, it is not uncommon to find trees of all ages, from gigantic specimens, with clean symmetrical trunks 50 feet long and 3 to 6 feet in diameter, downwards to a dense growth of young seedlings, a constant process of renewal being evident through the entire area. At others, the forest consists of trees of almost uniform dimensions, and so closely set that the eye can only pierce a short distance between the trunks.

The timber of the tooth-leaved beech is rather stout-grained, but hard and durable, well adapted for sleepers, constructive works, and all purposes requiring strength and durability. It is the most valuable of the New Zealand beeches, and has the widest range, occurring from Ahipara to Stewart's Island.

50. Round-leaved beech, *Fagus Menziesii*. A noble tree, often fully equalling, or even surpassing, the tooth-leaved beech. When young, its bark is white, and resembles that of the European birch, *Betula alba*; but in mature trees it is often fissured longitudinally, a difference which has misled many observers. The leaves are ovate or rounded, coriaceous, with rounded indentations or crenatures on the margin, and with indistinct veins.

The timber is finer in the grain and more compact than that of the tooth-leaved beech, so that it is readily worked; when grown in mountain districts it is probably little inferior in durability to the preceding species, but when growing in low alluvial land, as at Catlin's River, it may be less durable. In the upper part of the Buller Valley, and other localities where it has been much used, it is considered of even greater value than *F. fusca*, as affording durable timber.

51. Entire-leaved beech, *Fagus Solandri*. This species does not usually attain the large dimensions of either of the preceding, although in favourable situations, at low elevations, it is occasionally but little inferior. It is distinguished by its rather stiff entire leaves, which are wedge-shaped at the base, and often white below. The spray is very short and thick-set, so that the tree has a more rigid habit than either of the other species. It is the most abundant form at high levels. Its timber is of comparatively little value, on account of its want of durability, and is now but little used, except in situations where other timbers cannot be obtained.

52. *Fagus Cliffortioides*. This species has been generally confused with *F. Solandri*, which it greatly resembles at first sight. It is usually of small size, 50 feet, with a trunk $1\frac{1}{2}$ feet to 2 feet in diameter and may be distinguished from *F. Solandri*, the entire-leaved beech, by its leaves being roundish or heart-shaped at the base instead of wedge-shaped; they are moreover somewhat larger and thinner. Its spray is more graceful than that of the preceding species, and closely approaches the European *F. sylvatica*. Nothing definite is known as to the quality of its timber, which will probably be found to resemble that of the tooth-leaved beech. Should this be the case, it will account to a great extent for the contradictory opinions expressed regarding the durability of the timber of *F. Solandri*, which is certainly the least valuable of the New Zealand species.

53. The various beeches are termed almost indiscriminately black, white, red, or brown birches, so that no reliance can be placed on their application; the same names are also applied to other timbers.

DISTRIBUTION OF SPECIES.

CLASS I.

1. *Dammara australis*, Lam. Kauri.—North Island: From the North Cape to Maketu, on the East Coast, and Kawhia on the West. Kauri forests, however, are not found south of Waiuku on the West Coast, or Katikati on the East; although isolated trees occur as far as the localities