

too, of the limited knowledge forty years ago of forestry, as compared with the advances made during that period, it is a matter of keen surprise that they succeeded so well as to produce results—which speaks volumes for their grit—such as the plantations which are now the pride of the community.

Chiefly owing to Canterbury, New Zealand takes first place in Australasia in the extent of area planted with trees. Necessity early taught the people the value of trees for firewood, as also for shelter of stock and crops; and the experience of Canterbury in this matter has ever since represented a great object-lesson to the people of New Zealand on the advantage of forest culture. The many thousands of acres planted over the bare plains have made numberless converts to the science of forestry as a practical aid to successful stock-raising and to the cultivation of farms. There can be no question as to the great increase in both stock and agricultural produce resulting from the improved carrying- or producing-powers of land sheltered by trees, groves, or hedges as compared with those of bare, open plains. On the latter, stock driven by wind and cold are always on the move, destroying, with their trampling, more grass than they eat, and crops exposed to every wind that blows cannot compare in quality, size, or value with those sheltered by rows or belts of timber, hedges, &c., which cut off the cold blasts of winter, and grazing or growing under the warm air or vapour given off by trees in mass, which mitigate to a large extent the severity of frost and cold. That trees have this effect forestry science has demonstrated again and again beyond the possibility of doubt. The people of Canterbury have, I take it, so clearly proved this fact for themselves in practical results that, in their case at least, the scientific proofs of this theory (and they are easily obtainable) are not required. I may venture, however, the broad statement that the Province of Canterbury has more than double producing-power in farm and stock produce in the tree-planted areas than in the open parts of the country. Stock, when grazed in sheltered places, lie about more in the sun, consequently are not eternally nibbling at the grass and treading it to dust as they travel about. Stock, in fact, are more contented under shelter (because more comfortable) than when exposed, fatten quicker, and, what is more, retain their fat longer. Crops in the same proportion, grown in sheltered situations, give better results both as to quality and quantity.

When the pioneers of planting in Canterbury battled with strong winds and bitter frosts it may be presumed that if their knowledge of forestry had included sufficient scientific training to make judicious selection of the best trees to plant it would have been of immense value to them and their successors. Grave errors in this direction may be detected all over the province, and but for the fortuitous selection of the blue-gum heavy losses must have been incurred. The extraordinary adaptability of most of the *Eucalypti* is now well known. The blue-gum is, thanks to the late Baron von Mueller, grown in many parts of the world. In the Pontine Marshes and other places in Italy this tree, recognised as a most valuable anti-malarial agent, has been extensively planted. It is grown successfully in California, and tropical India has no terrors for it, while the snow-clad heights of the Simla hills tower over large plantations. In Algiers it is extensively planted by the French; while in South Africa the same *Eucalypti* seems destined to become the staple timber tree of the Rand and Veldt.

The blue-gum, therefore, though probably chosen by chance, was an excellent selection for Canterbury, and the tree was wisely brought over from Tasmania. Many a planter of these trees, however, must have felt bitterly disappointment at finding them time after time cut down by frosts, for, although adapting itself readily to so many climates, the *Eucalyptus* is unusually susceptible to frosts.

In Victoria and Tasmania—the native habitats of the blue-gum—it rarely grows above 1,500 ft. above the sea-level, and, excepting a few dwarfed and stunted snow-gums, the *Eucalypti* generally follow this rule. A new genus was found on the ranges between New Norfolk and the Huon River by Mr. Thomas Moore, and reported by him to Baron von Mueller, but through lack of full information this species has not, I think, been classified. A fine timber-tree—*Eucalyptus sieberiana*—grows in Gippsland, and was one of the best on the top of Mount Macedon in the old sawmilling days. This tree is certainly frost-proof, and grows to large size at 3,000 ft. above sea-level. The habitat of the blue-gum in both Victoria and Tasmania is generally littoral. In the latter colony it is extremely so, but in Victoria a curious variation of this rule occurs, for the blue-gum grows in several inland districts, far away from sea influences. In the Mount Cole State Forest, near Ararat, the Stanley State Forest, near Beechworth, in places along the Mitta Mitta Valley, and on the table-land of the King River district, near Hedi, this gum is found and produces timber of most excellent quality at altitudes of 2,000 ft. to 2,500 ft. These facts indicate the special adaptability of certain *Eucalypti* to particular localities other than those to which they are indigenous, and serve as a guide in selection. I am of opinion, indeed, that by obtaining good seed from the forests named above, tree-planters would be able to grow hardy *Eucalypts* in Canterbury and Otago.

With trees, as with live-stock, grain, &c., improvement in quality depends upon judicious selection of the original stock. I strongly recommend the *Eucalyptus sieberiana* for the Middle Island, for the reasons given above, and have no doubt that seed may be obtained at Mount Macedon from young trees. Care should be taken, however, to see that the seed is botanically correct, and stipulation should be made that capsules, or seed-vessels, with a few leaves, buds, and flowers, should also be sent for the purpose of scientific identification. The absence of scientific knowledge or direction, of course, fully accounts for many mistakes in the methods of planting and cultivation adopted, such as I noticed during the course of my hurried examination of the plantations in and around Christchurch, where many planters, having put in the trees, often too far apart, simply left them to grow as they could. Others, again, planted pines—chiefly *Pinus insignis*—among gums—a very grave error, because the essential oils and vigorous growth of the *Eucalypts* invariably injure other trees planted among them.

On account of the superior climate of Australasia, I advocate the planting of trees in separate sections, and not in association with other varieties. Blue-gums, for instance, always thrive best