

The utilization of the waste tops, branches, leaves, and stumps of trees for conversion into potash, while proving a source of profit, would at once greatly reduce the risk of fire in standing forest—one of our greatest dangers under the present want of system.

The waste tops and roots of the New Zealand pines might also be utilized in the manufacture of tar and pitch, which are imported at present to a considerable amount. Under suitable arrangements, the manufacture of charcoal and extraction of tar could be carried on conjointly.

Valuable oils could be extracted from several forest trees, notably from the different species of rata, which are found in all New Zealand forests to a greater or lesser extent. The manufacture of eucalyptus oil is already assuming considerable proportions in Australia; but there is no reason to suppose that it possesses properties of greater value than that so freely produced by *Metrosideros robusta* and other plants closely allied to the Australian eucalypti.

PLANTATIONS.

I devote a section to a review of the plantations I have visited, and general consideration of results obtained by private enterprise in this direction, and what steps appear necessary in the shape of establishing plantations by direct Government agency, and encouraging tree-planting generally.

The first plantation visited was Mr. Firth's, at Matamata, in the Auckland Provincial District. It consists of *P. pinaster* and *insignis*, planted out straight from the mother beds, when about two years old, into furrows 18 inches broad by 10 inches deep and 15 feet apart. The growth has been very good, averaging 25 feet in five years; and Mr. Firth informed me that the cost had been small. Hitherto he has failed with deciduous trees; but, I have no doubt, with greater care as regards nursery treatment and planting them with nurses if required, he will yet succeed. The only fault which I saw in the plantation was that the trees are too far apart, which, I may state, is one very general in New Zealand. In and about Auckland itself the planting of clumps of trees has been largely undertaken, and the growth of the Norfolk Island pine (*Araucaria excelsa*), *P. insignis*, *austriaca*, *tuberculata*, *pinaster*, *radiata*, *Cupressus macrocarpa*, *torulosa*, and others, forms a marked feature in the landscape. The public gardens contain fine specimens of many varieties of European and Californian conifers, whilst the oak trees in the garden of Government House appear to flourish no less luxuriantly than their more tropical brethren. It may be said in general of all towns in New Zealand that much attention has already been paid to planting, and that, wherever there are public gardens or domains, the greatest care appears to have been taken to introduce and acclimatize all descriptions of trees and shrubs valuable either for their timber or ornamental planting. Wellington, from its situation and want of space, compares at present badly with most other places; but I have little doubt that Dr. Hector will succeed ere long in making the public gardens there worthy of the capital of the colony; and meanwhile, a visit to Messrs. Ludlam and Mason's gardens, at the Lower Hutt, will satisfy the most ardent lover of variety in tree growth, and furnish a useful and interesting study of the habits and rate of growth of the numerous introduced varieties.

I paid special attention to plantations and the requirements of the country in this respect in Canterbury and Otago. In the former much has been done in the shape of ornamental planting, and under the provisions of "The Tree Planting Encouragement Act," under which, however, I find that the total awards, up to end of November last, were 765 acres, representing a total area of 382 acres planted, and not thousands, as was stated in the House last session.

The eucalypti plantations at Kirwee (Colonel Brett's), Burnham, Rakaia, Mr. Wason's station, Timaru, &c., may be said to be successful, the prevailing descriptions being *E. globulus*, *amygdalina*, and *viminialis*. Those at Burnham, and Mr. Middleton's, at the Rakaia, appear, on the whole, to have afforded the best results, considering the cheap method of planting adopted at Burnham; the land is ploughed twice, harrowed, and seed mixed with sand, then sown broad-cast. Some wattle (*A. dealbata*) has been sown with the eucalypti, the advisability of which is doubtful. The growth under such a system is, of course, irregular; but some trees two years old are fully 10 feet high. The estimated cost per acre is 30s., without the fencing. Mr. Middleton's small plantation of 10 acres has been very successful, and some of the trees four years old are fully 30 feet high. He has used broom in some portions—a plan which has also been adopted by Mr. Wason, who has 250 acres planted with conifers, eucalypti, oak, poplar, &c. There is also a Government plantation of 80 acres at the Rakaia, sown broad-cast, on the same system as at Burnham.

In Mr. Sealey's extensive eucalypti plantations near Timaru, the trees first put out—which, I believe, were transplanted from nursery beds—have done well, and average 20 feet in height with fine straight stems, the distance apart being 6 feet, and 9 feet between the rows; the later planting, or rather broad-cast sowing, cannot be deemed a success. The soil is apparently very light. Mr. G. Holmes's planting at Bangor has been conducted with a view more to ornament and shelter than financial results: in fact, no care or expense has been spared to make the trees grow well, and we cannot therefore be surprised at their doing so. Many, or in fact most of them, are planted out in pits four feet square, a crop of oats having first been taken off the land, which is poor. I observed *P. atlantica* and *ponderosa*, along with the deodar, spruce, and larch (doing exceedingly well), and the oak and other hard-wood trees. Mr. Holmes finds that the blue-gums do not grow to advantage on account of the frosts. At Homebush, close by, the Scotch firs fifteen years old exhibit a fair growth, which would have been much better had they been planted closer. I was unfortunately unable to visit Mr. Potts's plantations at Governor's Bay, which I much regret. The finest plantations, however, which I have seen in the colony, are certainly those of the Hon. W. Robinson, at Cheviot Hills, in the Nelson Provincial District, which I visited in February, 1877. I was unable to ascertain the exact extent, but there are certainly 300 or 400 acres under timber. Some pure oak plantations, planted at 6 feet apart, are doing exceptionally well; the trees straight and without any tendency to become stag-headed; they average about 30 feet in height, and were planted about ten years ago. A young plantation of spruce, planted amongst *Pinaster*, which is to be gradually removed as the spruce comes on, promises well, as do also the young larches.