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# THE OTARI OPEN-AIR NATIVE-PLANT MUSEUM.

J. G. MACKENZIE, Director of Parks and Reserves, Wellington, and L. COCKAYNE, Honorary Botanist, New Zealand Institute of Horticulture.

## Introduction.

WHEN, some eighty-seven years ago, the City of Wellington was founded most of the country in its immediate vicinity was clothed with noble forest. The pressing demand for timber and firewood, as also for farm lands, led by degrees to the destruction of nearly all this primitive tree-community, so that at the present time only a few isolated portions remain, for the most part greatly altered in structure, though some bear more or less their primitive stamp.

The best known of these forest-remnants is that generally designated "Wilton's Bush." This, up till October, 1907, was the property of Maoris, but on that date the Government purchased the land from its Native owners, the Wellington City Council contributing £500 of the purchase-money. The area was forthwith proclaimed a scenic reserve, to be administered by a Board of seven members, of whom the Commissioner of Crown Lands for the Wellington District was to be chairman, and the chairman of the Reserves Committee of the Wellington City Council a member *ex officio*. But the Board could do little in the way of improving the reserve (making paths, fencing, &c.) through lack of funds; so in 1916 it passed a unanimous resolution requesting the Government to vest the reserve in the Wellington City Council. This position the Council would not accept unless the reserve became the property of the city. Finally, after negotiations had proceeded for some time, the reserve was handed over to the City Council in 1918 on their paying a further £700 for the property. Thus for the past nine years the reserve has been cared for by the Council, paths have been made, fences erected, the stream bridged, grazing within the precincts of the reserve forbidden, and the forest given a chance to slowly regenerate.

During the last two or three years more particularly—though really the need has been recognized for a long time—a strong feeling has arisen among those interested in the indigenous plants—no mean number of the public—that as complete a collection of such plants as possible should be established within easy reach of the centre of the city, where they could be enjoyed by the public and afford also material for study. This important matter was discussed at various times by the Council of the New Zealand Institute of Horticulture, but no definite steps were taken towards the desirable end. Eventually the City's Director of Parks and Reserves suggested in the daily Press that Wilton's Bush would be suitable for the purpose, and at some length he explained its value. This stimulus was exactly what the Institute of Horticulture required, and a deputation from that body, headed by its president, Mr. F. J. Nathan, waited on the Reserves Committee of the City Council and urged that the idea of the Director of Parks be adopted, pointing out at the same time what such meant to Wellington—and, indeed, to New Zealand. The Committee were most sympathetic, and promised to further the desirable project.

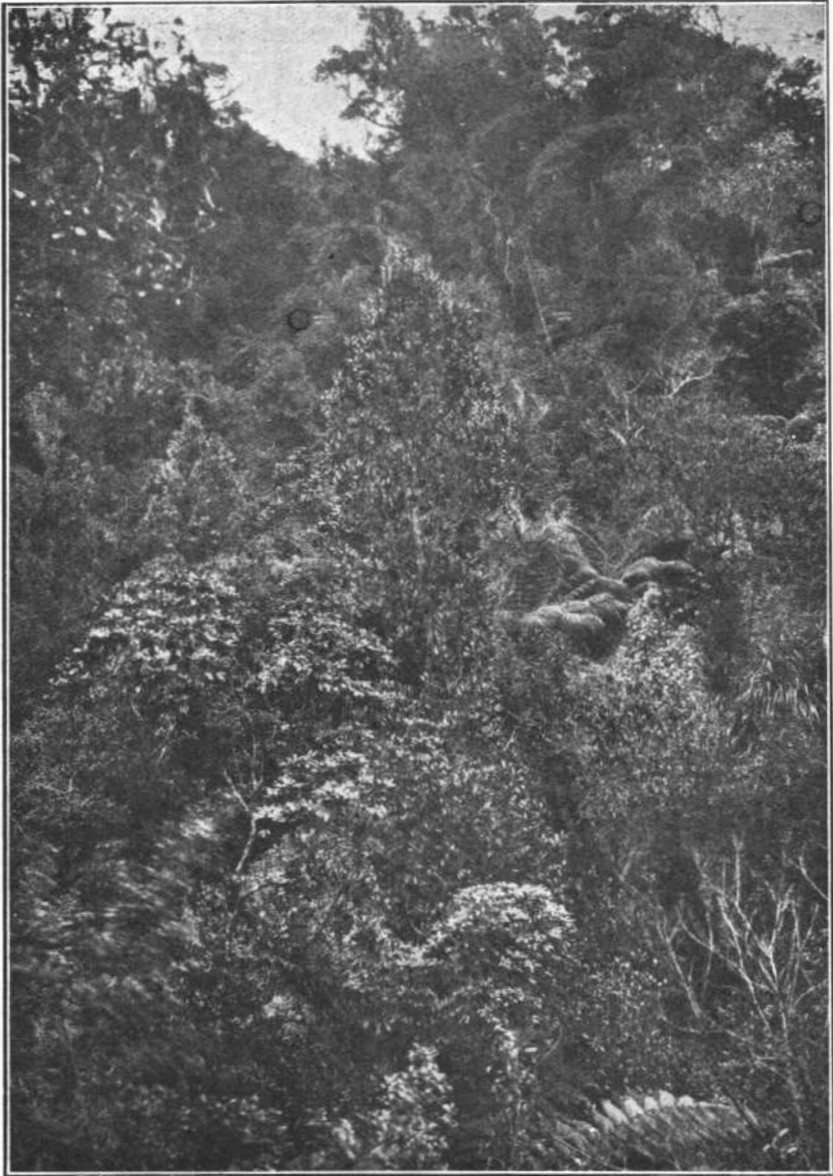


FIG. I. PORTION OF THE ORIGINAL FOREST STILL ALMOST VIRGIN.

In centre the rewarewa (*Knightia excelsa*).

[Photo by H. Drake

A few days later the Honorary Botanist of the Institute of Horticulture, acting on behalf of the Institute and with the approval of the Director of Parks, drew up a full report on the subject, which was submitted to the Reserves Committee and accepted by them in its entirety. This report appeared in full in all the Wellington daily papers; and it is the ideas embodied therein, and their explanation, which is the main motive of this article. In other words, we seek to put on permanent record the history of this important movement, which, as will be seen, is truly a national movement, also the plans for carrying it out as endorsed by the City Council and the Institute of Horticulture. Further, we may explain that the scheme has been the subject of various eulogistic articles in Great Britain, which have appeared in such authoritative publications as *Nature*, *The Garden*, *The Gardeners' Chronicle*, and *The Kew Bulletin*. Also, much help has been promised spontaneously by lovers of New Zealand plants in various parts of the Dominion.

As a preliminary to the great work in hand, His Worship the Mayor of Wellington, Mr. C. J. B. Norwood, arranged for an official opening of the Museum and invited the citizens and others to be present. Notwithstanding most inclement weather, there was a large gathering, including the Hon. J. Hawken, Minister of Agriculture, and the Hon. R. A. Wright, Minister of Education. Memorial trees (kauris, rimus, totaras, &c.) were planted by the Mayor and Mayoress, the Ministers of the Crown and their wives, and others. Interesting speeches were delivered, and the reserve itself was explored and its beauty admired; in short, a most important public movement was fairly launched, and the career began of the Otari Open-air Native-plant Museum—Wilton's Bush no longer.

The area occupied by the Museum is about 143 acres, perhaps one-half of which is occupied by forest, some of which is practically virgin (Fig. 1). Much of the area consists of fairly steep slopes, but there are many level places of considerable size (Fig. 2), and there is every variety of aspect—a most important feature. The lowest part consists of a valley through which flows the Kaiwharawhara Stream (Fig. 3), which is crossed by a bridge (Fig. 4) leading by a natural pergola (Fig. 5) into the heart of the reserve. The unforested portion (Fig. 2) is of special moment in regard to the scheme now to be outlined.

#### **Scheme for dealing with the Reserve.**

The scheme adopted (but of course subject to minor modifications) is fourfold. It is not designed for immediate application as a whole—that would be impossible, even if advisable—but it will take many years. Briefly, this fourfold treatment resolves itself into the following distinct subjects: (1) The flora, including both the systematic and biological sides; (2) the vegetation; (3) horticulture; (4) restoration of the forest. We deal with them in that sequence.

#### THE FLORA.

In regard to the flora of New Zealand, it is intended to introduce into the reserve as complete a collection as is possible of the species of flowering-plants and ferns to be found in the New Zealand botanical

region. These number about eighteen hundred, and rather more than three-fourths are found only in New Zealand; the remaining one-fourth also occur as wild plants in other countries, a large majority being Australian. It may be explained that the flowering-plants comprise the trees, shrubs, semi-woody plants, and annuals and herbaceous perennials.

The species will be arranged as far as practicable according to their families. We say "as far as practicable" advisedly, since in many cases certain species, so closely related to others that they belong to the same genus, cannot live under the same conditions as their fellows and must be grown under a different environment. For example, the pigmy-pine (*Dacrydium laxifolium*) of mountain moorland cannot be grown side by side with the giant rimu (*Dacrydium cupressinum*)—

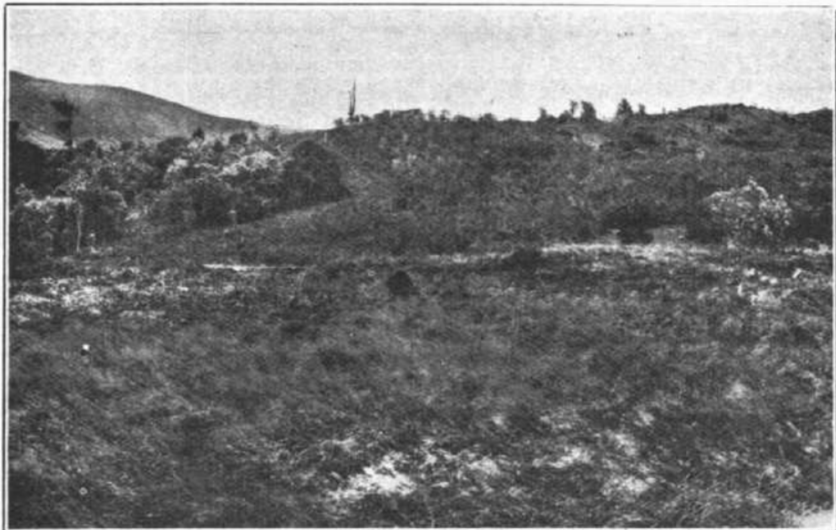


FIG. 2. ONE OF THE FLAT PORTIONS OF THE AREA, SUITABLE FOR PART OF THE SYSTEMATIC COLLECTION OF THE FLORA.

In the upper part of the view is seen damaged forest.

[Photo by H. Drake.]

a forest-tree; nor can the lovely purple-flowered shrubby daisy of the Chatham Islands (*Olearia semidentata*)—a glorified Michaelmas daisy—be cultivated alongside its easily grown relatives of the subalpine scrubs. In short, botanical classification must not stand in the way of expediency, however much the herbarium botanist may look askance.

As well as the species, the hybrids between such will be cultivated, and their presence in cultivation will be of the greatest moment for the plant-classifier and the student of evolution. The number of such groups of hybrids in the New Zealand flora—usually great swarms of different-looking individuals—is probably considerably more than two-hundred and fifty, most of which have only been known for the last two or three years. Of such one of the writers (L. C.) has dozens in his own garden waiting for their place in the Otari Museum.

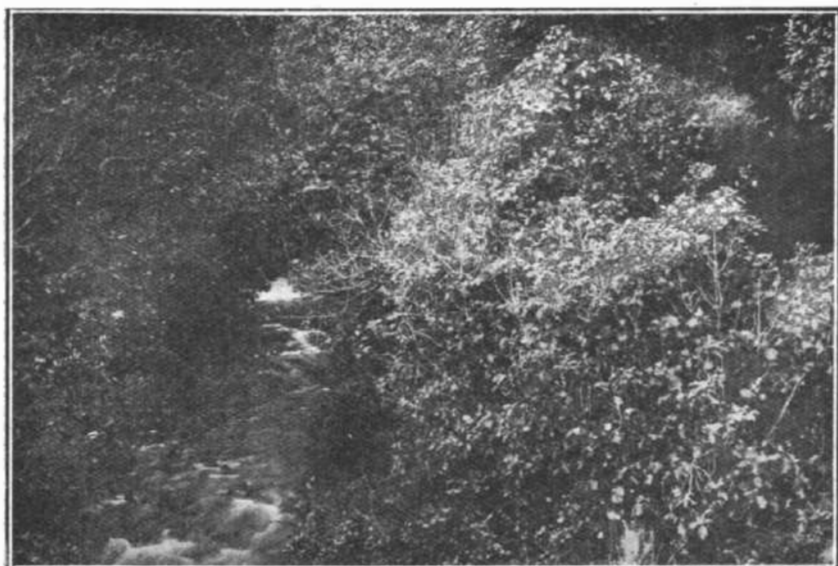


FIG. 3. THE KAIWHARAWHARA STREAM AS SEEN FROM THE BRIDGE NEAR THE LOWER ENTRANCE TO THE OPEN-AIR MUSEUM.

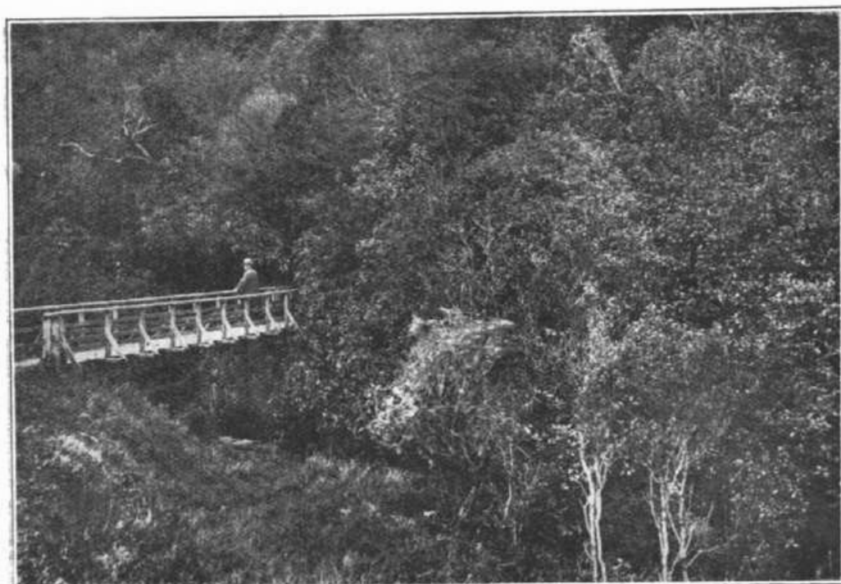


FIG. 4. THE FOOTBRIDGE OVER THE KAIWHARAWHARA AT THE LOWER ENTRANCE TO THE AREA.

To right and above greatly modified forest consisting largely of rangiora (*Brachyglottis repanda*).

[Photos by H. Drake.]



FIG. 5. THE NATURAL PERGOLA LEADING INTO THE CENTRE OF THE AREA.

[Photo by H. Drake.]



Each species in this systematic collection will be labelled accurately (the best botanical advice being always procurable), and in addition to its name will be appended its distribution in New Zealand and its habitat (the kind of place it naturally grows in—forest, swamp, dune, rock, &c.). Thus, when complete, almost the whole New Zealand flora will be seen at a glance, as it were, and the seasonal changes and other biological matters concerning each species can be observed.

It should go without saying that to have ready access to such an accurately labelled living flora will be of inestimable value for teachers and pupils, for nature-lovers, for professional botanists, as also for horticulture, agriculture, and forestry.

Besides being classified according to their relationships, plants can be grouped according to their forms, such being the outward expression of their relation to the places where they grow. Such forms are called "life-forms"—the forms, that is, upon the possession of which their very existence depends. In this regard New Zealand plants have much to tell, some of which is specially characteristic of the region. Collections of life-forms will be an interesting feature of the museum. Indeed, much of moment is there already. Thus, the climbing or liane form is greatly in evidence (Fig. 6); the possession of a long-persisting juvenile form distinct from that of the adult, as in the milk-tree (*Paratrophis microphylla*) and the mighty matai (*Podocarpus spicatus*) (Fig. 7); or the tussock form of many grasses, sedges, and even of the New Zealand flax (*Phormium tenax*).

#### THE VEGETATION.

More important than a classified living flora, and *something not yet attempted in any garden in the world*—and this is what makes the scheme unique—are to be representations of portions of the primitive vegetation of New Zealand. It must be clearly understood that the flora and the vegetation of a country are two quite different things. That is, the *flora* is concerned with the species merely as species, but *vegetation* with the combinations of species as they grow side by side, such combinations taken all together making the plant-covering of the land. Thus the flora of a region can be readily illustrated by dried plants in a herbarium, but the vegetation can be seen only in nature, or it can be represented by drawings or by photographs.

In nature plants do not grow haphazard, but they form well-defined communities, each more or less distinct from any other. So there are large communities, such as grassland, forest, shrubland, the plant-covering of boggy ground, of sand-dunes, and so on, and each of these may be subdivided into different smaller communities. Take forest, for instance: There is coastal forest with the karaka (*Corynocarpus laevigata*) dominant, or kauri (*Agathis australis*) forest, or southern-beech (*Nothofagus*) forest, or tawa (*Beilschmiedia tawa*) forest, to cite a few kinds. It is of such natural, virgin communities that artificial, accurate representations are to be attempted in the open-air museum. Thus it is hoped to be able to make a small piece of kauri forest and patches of other types of forest—for example, that of lowland Chatham Island. The subalpine scrubs of the high mountains, the manuka thickets of northern Auckland, the *Hebe* (koromiko) communities of

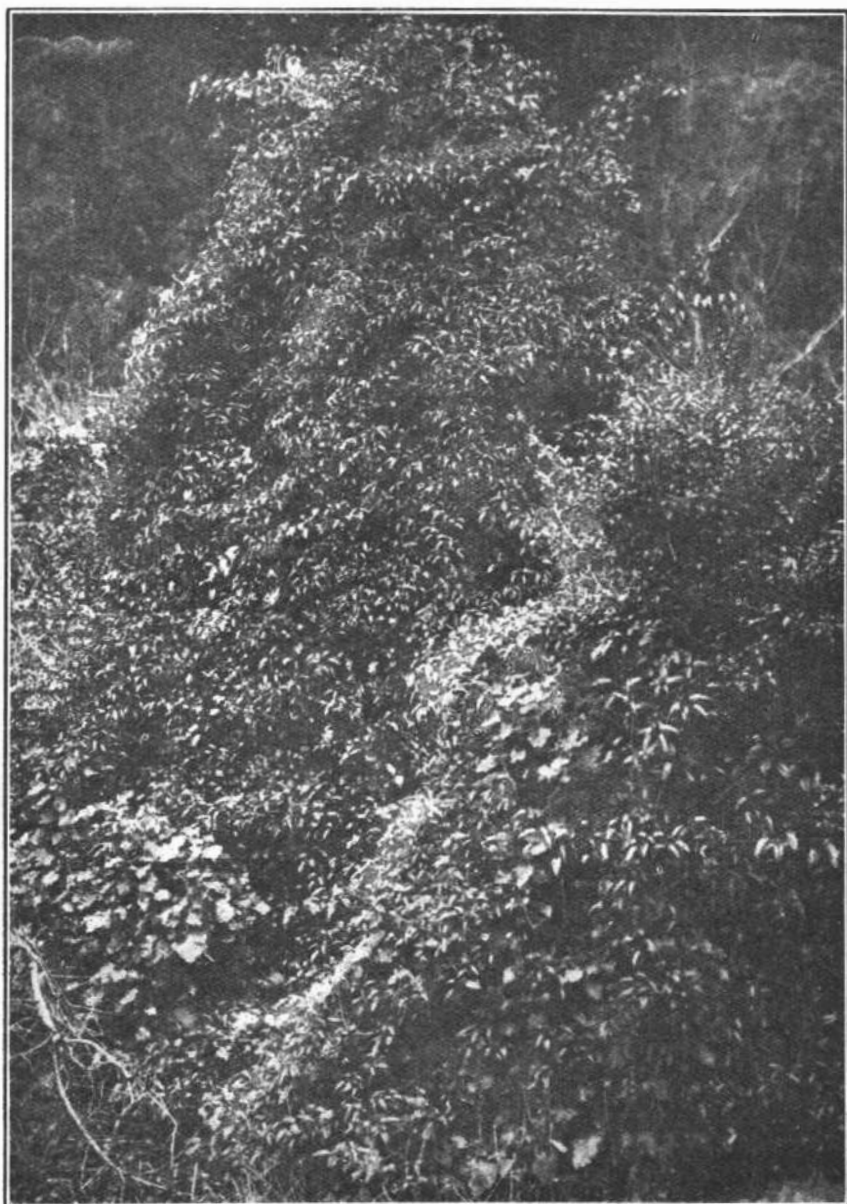


FIG. 6. THE LIANES—PASSION-VINE (*TETRAPATHAEA TETRANTRA*) AND BUSH-LAWYER (*RUBUS AUSTRALIS*).

[Photo by H. Drake.]

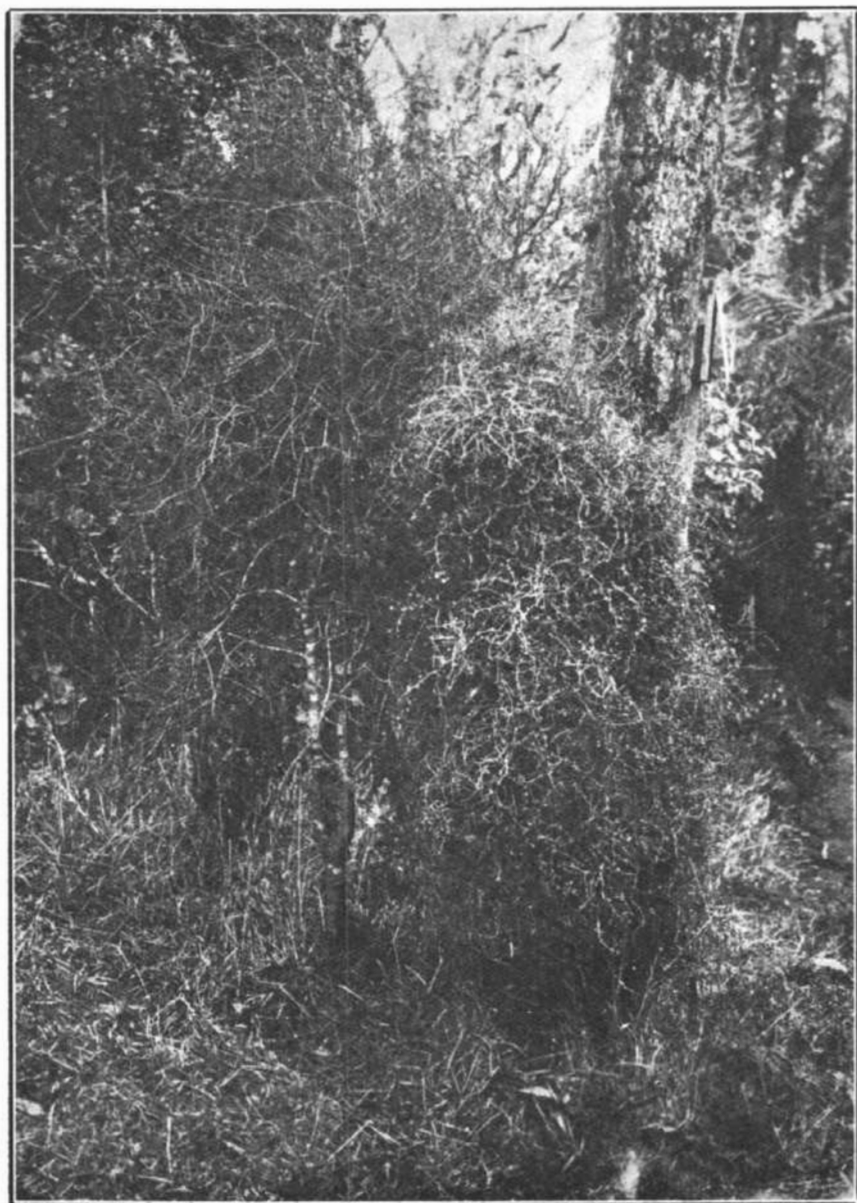


FIG. 7. ON RIGHT, JUVENILE MILK-TREE (*PARATROPHIS MICROPHYLLA*); ON LEFT, JUVENILE MATAI (*PODCCARPUS SPICATUS*).

[Photo by H. Drake.]

Canterbury, the cliff vegetation of Marlborough (a cliff awaits its new garb) are a few communities among many others which may probably be easily imitated and successfully established.

In the Motherland, and indeed in Europe generally, to reproduce the virgin vegetation is impossible in the majority of cases, since there are no longer living examples of such communities. But in our land, though the face of nature is day by day being changed out of all recognition, fortunately most of the plant-communities can still be seen in their virgin state, but usually far from the beaten track. Moreover, many have been so described that models are available for the gardener, aided by the botanist, to copy. Thus by degrees primitive New Zealand, as it was before the white man, or possibly the Maori, came on the scene, may in time be brought back again and have its home in an actual city.

#### HORTICULTURE.

This part of the scheme is also of a distinctly novel nature. The idea is to illustrate what use can be made of New Zealand plants in horticulture. Many wish, nay long, to grow the plants of their native or adopted land, but they know neither which to grow nor how to grow them. Thus, there can be readily established groves (not isolated plants) of trees celebrated for beauty of flower or elegance of form—for example, pohutukawas (*Metrosideros tomentosa*), kowhais (species of *Edwardsia*), lacebarks (species of *Hoheria*), the mountain-ribbonwoods (*Hoheria glabrata*, *H. Lyallii*), and cabbage-trees (*Cordyline australis*). Hedges of various species will be planted illustrating their relative value for the purposes of low or tall hedges and shelter-belts. Small gardens of native plants will be made in order to show what can be done with such by those with limited garden space.

An extremely important feature of this horticultural series will be a real alpine garden. Such can readily be formed on the banks of the stream (Fig. 8), and, judging from our experience in the cultivation near Wellington of New Zealand high-mountain species, the place selected should be an ideal spot. We feel certain that most of the mountain-daisies (species of *Celmisia*), the ourisias (species of *Ourisia*), and some of the large buttercups (species of *Ranunculus*) will grow admirably. Indeed, we are sanguine enough to believe that the famous mountain-lily (*Ranunculus Lyallii*) may become well established. This alpine garden will be one of the first pieces of work to be put in hand.

#### RESTORATION OF THE ORIGINAL FOREST.

Finally comes the question of how to deal with what remains of the "forest primeval." Here one essential point stands out clearly: this is that (with one proviso) no plant should be planted in the forest which was not originally in a similar plant-community of the neighbourhood. In certain places the forest is still intact (Fig. 1); there it must religiously be left alone. But in many places it is greatly altered from what it was originally (Fig. 9). Certainly nature is repairing the damage, but her methods are rarely rapid, nor would the new forest she is creating match her original handiwork. Man can do the work more rapidly, and, armed with scientific knowledge, can place in the forest, each in its proper situation, those species lacking or those not in sufficient numbers. Dozens of nikau-palms (*Rhopalostylis sapida*) will have to be

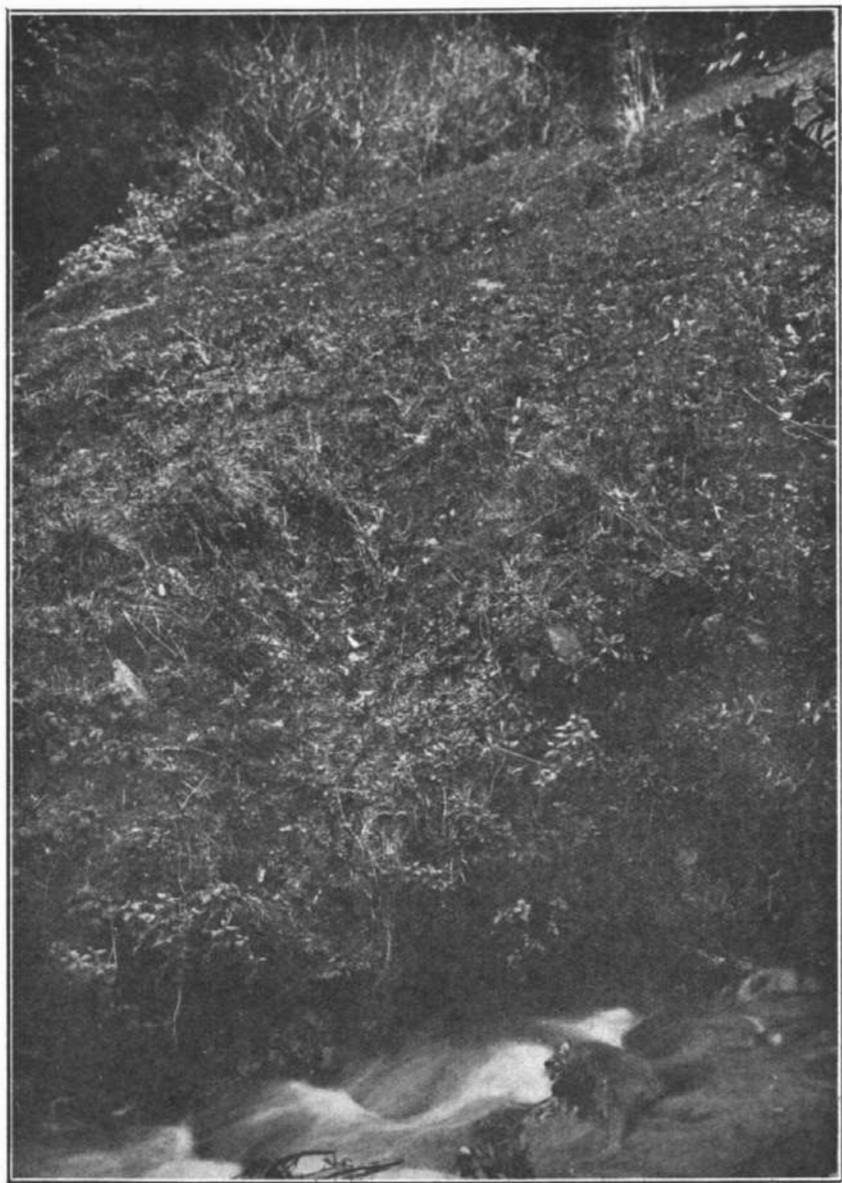


FIG. 8. PART OF THE SITE OF THE PROPOSED ALPINE GARDEN.

[Photo by H. Drake.]

introduced; so, too, with the podocarps and other tall forest-trees; also the number of tree-ferns is insufficient, and the amount of rangiora (*Brachyglottis repanda*) too great. But a detailed survey of the forest is needed before rules for its restoration can be drawn up.

A proviso was attached to our statement in regard to planting nothing which was not originally in the forest. An attempt will be made to grow all the ferns of New Zealand (about one hundred and forty). Most will not grow in the open; they must have shelter and shade within the forest. Therefore a gully will be set apart for the fern collection; and there is one well suited for this purpose, easy of access, and in proximity to the site of the alpine garden. Here the

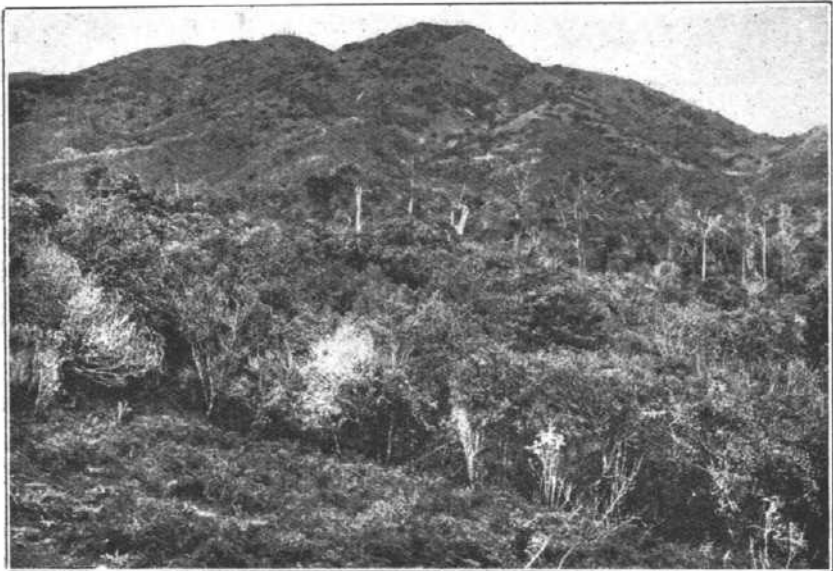


FIG. 9. FOREST MUCH DAMAGED AND MODIFIED, AWAITING RESTORATION.

[Photo by H. Drake.]

planting can be begun without delay. Nor is such use of the one gully hostile to our motto, "Bring back the forest to its original composition and status, but change it not at all."

### Summary.

In this article is told how Wilton's Bush, or the Otari Native-plant Museum, came into the hands of the Government, which constituted it a scenic reserve, and how, later, it was acquired by the Wellington City Council, partly by purchase. Further, it is explained how the purpose of the reserve was altered—largely through the action of the New Zealand Institute of Horticulture—and how it has been constituted an "open-air native-plant museum" where nothing is to be grown save the indigenous plants of the New Zealand region.

The plan upon which the museum is to be arranged—a plan approved by the City Council—is explained at some length. Briefly, it consists of a fourfold scheme, including (1) a collection of all the New Zealand species which can be grown; (2) examples, to be artificially made, of various important features of the primeval vegetation of New Zealand—this a unique undertaking; (3) the use of indigenous plants for horticultural purposes to be illustrated in various ways for the information of those desirous of using such plants in their gardens; and (4) the restoration of the present forest to what it was originally.

This plan in its entirety is the first to be formulated in any part of the world. It is full of possibilities for the good of the people. It is not for Wellington only but for the Dominion as a whole. Indeed, as the flora and vegetation of New Zealand are considered of special interest the world over, the influence of the Otari Open-air Native-plant Museum will be world-wide.

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