Including
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LECTURE

"Sylvan Cathedral"

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JOURNAL OF THE
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The History and Development of Tree Planting in Canterbury

THE BANKS LECTURE, DELIVERED AT TIMARU ON FEBRUARY 7, 1946

By M. J. BARNETT, Superintendent of Reserves, Christchurch City Council.

IT will be impossible in this article to cover adequately all aspects of the subject or to do full justice to those early pioneers and planters who laid the foundation of tree-planting in Canterbury. It is likewise impossible to give a list of all the kinds and varieties of trees and shrubs which have been introduced to our gardens and plantations. Interested visitors from overseas have not infrequently complained of the difficulty of obtaining authentic information about the age and origin of our more noteworthy trees. Much of the information required may be gleaned from the notes, diaries, and writings of the early settlers and pioneer planters. The difficulty is to reach these sources, to sift the facts, and to correlate the information.

WE are still a very young country, with the future as a nation before us. But many of the facts and much of the past history on such subjects as tree-planting, if not officially recorded before it is too late, will for ever be lost.

Though various parts of the province are mentioned, this article is designed to deal more specifically with tree-planting on the Canterbury Plains than with that which took place on the downlands and higher country.

THE PLAINS BEFORE THE SETTLERS ARRIVED

To give some idea of the conditions which faced the settlers when the colonisation of the plains began, it is necessary to give a brief account of the geological formation, the type of soil, the climate, and the type of indigenous vegetation which existed then, and which, for that matter, with the exception of the vegetation, still exist to-day. The best authorities on the subject state

MR. BARNETT

CEDAR OF LEBANON (Cedrus libani) in Risingholme Park, Opawa, Christchurch. The top of the tree was destroyed by a heavy fall of snow some years ago.

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"SYLVAN CATHEDRAL": The photograph on the cover, by F. Sydenham, depicts a portion of an avenue of Oriental planes **(Platanus orientalis)** planted two rows on either side of a broad highway leading from the Royal Palace at Caserta toward Naples.

that the plains were formed by the torrential rivers which carried, and still carry, huge quantities of detritus down from the great mountain ranges toward the sea. These rivers, fanning out as they reached the flatter country, built up vast deposits of shingle, silt, and clay. It is considered that the hilly country of Banks Peninsula at one time formed a separate island. The continual depositing of spoil from the mountains gradually built the plain outward into the sea until the mainland became connected with the island.

The vast quantities of spoil carried downward by the rivers gradually built up the beds of the streams, and so impeded the flow of water that they periodically changed their courses when in full spate. In some instances this process is still going on, and large sums of money have been and still are being spent on river protection works to confine the waters to regular channels.

During periods of heavy rain, or after sudden melting of the snowfields back in the mountains, or a combination of both, these rivers and streams would within a few hours become raging torrents. On the other hand, during the summer months and in times of even a mild drought some of them would disappear for miles below the shingle bed to the lower strata; the River Selwyn is an excellent example of this.

SOIL AND CLIMATE

Throughout that great area between the Waimakariri and Rangitata Rivers the land consists mainly of a heavy deposit of shingle overlaid with clay, silt, and loam, varying in depth from nothing or a few inches to several feet.

However, Canterbury is by no means one large, arid wilderness, though some of the long stretches of that monotonous journey from Christchurch to the Orari by road or by rail would give that impression. But Canterbury, if not the finest, is one of the finest wheat-growing districts of the Dominion; Canterbury lamb is famous throughout Great Britain and in other countries; and the province has some of the richest dairying land to be found anywhere.

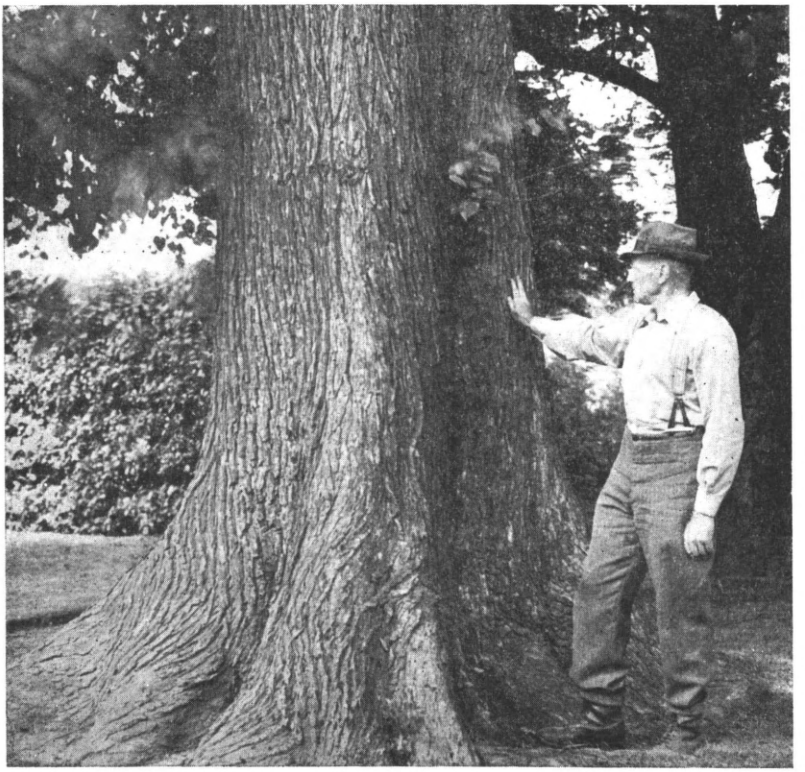
The climate is as variable as the moods of Cleopatra. "Age cannot wither nor custom stale her infinite variety." In this respect Canterbury is no worse than any other part of these windy islands, with perhaps this difference: On the plains the average rainfall varies from 23 to 30 inches a year. Unfortunately this somewhat limited rainfall is not evenly spaced throughout the year. Several inches may fall within a few weeks, and weeks may pass during the summer when rain is sorely needed without any appreciable amount falling. The winds, too, though perhaps not reaching the average velocity of those of Wellington, can be particularly trying and sometimes devastating in effect. Bitterly cold and boisterous south-westers in the winter and occasionally in the summer when "they didn't ought to be"; raw and persistent easterlies off the sea in and out of season; and during the summer and autumn months hot blustering north-westers which parch the land and have a most debilitating effect on plant life, and on some humans, too. Severe frosts and snowstorms also have to be faced.

VAST TREELESS AREA

Extensive tracts of indigenous forest or "bush" containing quantities of such timber trees as totara **(Podocarpus totara),** some rimu **(Dacrydium cupressinum),** black pine or matai **(Podocarpus spicatus),** and miro **(Podocarpus ferrugineus)** existed on the moister slopes and hills of Banks Peninsula. In the valleys and gullies of the western foothills of the mountains, rising range on range to the Southern Alps which divide Canterbury from Westland, limited quantities of totara and some rimu were to be found in certain localities.

On the higher elevations the bush was almost pure stands of native beech or birch, **Nothofugus fusca, N. Menziesii,** and **N. Solandri.** But with the

exception of very limited and isolated patches of bush, the main timber tree of which was the white pine or kahikatea **(Podocarpus dacrydioides),** situated in some of the heavier and more swamplike land near Christchurch—at Riccarton, Papanui, and Kaiapoi—the plains were one vast, treeless expanse of country covered for the most part with the dominant tussock, **Poa caespitosa,** and other native grasses and herbs, with here and there patches of tumatakuri or wild Irishman **(Discaria toumatou),** the New Zealand broom **(Carmichaelia spp.)** and other similar shrubs of a purely xerophytic nature. It is recorded that in 1865 within a radius of several miles of some districts the only fuel available for all purposes was dry cow dung, straw, and dry tussock, and that it was a common practice to collect and store dry cow pats for winter use.



PLANTED ABOUT 1865: A sound and healthy bole of the common elm tree **(Ulmus procera (campestris)),** growing in Abberley Park.

The following extract is from the diary of Dr. (afterward Sir David) Monro, for April 5, 1844. On arriving at the ridge of the hills between Lyttelton and Christchurch he described the aspect before him thus:—

> "But looking westward we had a magnificent view—an immense plain, apparently dead level, stretched away below our feet, extending in a direct line westward at least 30 miles and to the southward as far as the eye could reach, backed by a far remote chain of grand snowy mountains. The colour of the plain was brownish yellow, indicating it being covered with dried-up grass, and several rivers

with tortuous folds marked themselves upon its surface by the glitter of their waters. On this immense sea of plain there appeared to be hardly any timber."

Dr. Monro, who, with Messrs. Tuckett and Davidson, surveyors, was then engaged in investigating the suitability of this part of the colony for settlement, was not impressed, for in his summing up of the plains it is stated that: "The great drawback to the plain is the want of good wood upon it, and according to the scheme of the New Edinburgh Settlement this becomes almost a fatal objection"; and again in the same report that: "The climate of the plain behind the peninsula (Banks Peninsula), from what we have heard of it, is steady and, on the whole, fine, but large, low and level plains are always subject to greater extremes of temperature than country of an uneven surface." Monro was not aware that the apparently "low and level plains" have an average grade of from 15 feet to 40 feet a mile from the sea to the base of the foothills. The plains to-day have a vastly different aspect from that viewed by the early settlers nigh on 100 years ago.

URGENT NEED FOR TREES

Those were the conditions throughout the Canterbury Plains which faced the early settlers. Trees were urgently needed—trees to shelter their stock and homesteads, trees to provide them with fuel, and trees to supply them with stakes and posts for fencing. In 1865 there was not a single fence on the main road between Weedons and Timaru, the rivers being the only boundaries. It was therefore necessary to employ shepherds whose job it was to keep continual watch over the flocks to prevent their intermingling. In drought periods the scarcity of water was a real problem. Stock had to be driven daily to the nearest supply, and water for drinking and domestic purposes had sometimes to be carted for miles.

Faced with these trials and difficulties, it is little wonder that the pioneers gave early attention to the planting of trees. Tree planting on the Canterbury Plains may be said to have been started simultaneously with settlement. It has been stated on good authority that more trees have been planted in Canterbury than in any other province. If so, necessity was the great driving force.

However, all planting was not purely utilitarian. In an endeavour to reproduce the scenes of the Homeland and to beautify the landscape many of the first landowners and farmers planted trees for their aesthetic and sentimental value, and many a fine tree still catalogued as rare and noteworthy is to be found in some of the old gardens and plantations that were established in the early days. For example, in Mr. R. Bruce's garden at Akaroa there existed a magnificent specimen of **Magnolia Campbellii** with a trunk four feet in circumference. It is claimed that this specimen was obtained from Mason's gardens at Lower Hutt, and that Mr. Mason was a friend of Sir Joseph Hooker, who, after his botanical excursion to the Himalayas, sent him seed of the species. Unfortunately, through a mistake, a youth unwittingly felled the tree some years ago. The owner, who attached much value to it, was naturally very distressed, but the trunk sent up fresh shoots and the main leader is now 19 feet high.

WILLOW CUTTINGS FROM NAPOLEON'S GRAVE

Probably the first trees planted in the province were at Akaroa. The French settlers who arrived in 1840 brought with them cuttings of the weeping willow **(Salix babylonica)** obtained from Napoleon's grave at St. Helena. It is recorded that the emigrant ship L'Aube put in to St. Helena on its way to New Zealand, and that the French emigrants paid a visit to the grave of Napoleon. One of the company, probably an admirer of the great emperor, took four slips from the weeping willow growing over the grave, and carefully tended them throughout the rest of

the voyage, even to the extent of sacrificing part of his scanty water allowance to keep them alive. On arrival at Akaroa three out of the four survived. One was planted in the old French Cemetery on Laube Hill, the second in Balquerie Street, and the third at German Bay, now Takamatua.

Later a mission of French priests arrived, and some ten years later one of them departed for Wanganui, taking with him from these willows cuttings which were planted along the banks of that river, where they or their progeny continue to flourish. From the original willows at Akaroa, cuttings have been sent to all parts of the Dominion. I remember visiting Madame Tussaud's waxworks in London in 1913, and there on view was a piece of a trunk of weeping willow obtained, so the inscription read, from the River Avon, Christchurch, New Zealand, and setting forth the history of its introduction to Akaroa by the French.

The French were also responsible for the introduction of the walnut. Many of the original trees planted by the settlers still exist and are in good health, though now more than 100 years old. One has a trunk 18 feet 10 inches in circumference, is more than 100 feet high, and has a branch spread of more than 90 feet. The tree yields a yearly average of seven sacks of nuts, which are of excellent quality. The annual output of walnuts from Akaroa before the walnut blight became prevalent was estimated at 2000 sacks; during the past few years it has been about 1,000 sacks.

Tree-planting at Akaroa, however, was not governed by dire necessity, as it was on the plains. The hillsides and surrounding country were heavily covered with bush; there was ample firewood for the taking, good trees for milling and for fencing. The "bush" was looked on as something to be got rid of and not as an asset to be preserved. On the plains it was the very opposite. There was no bush, and tree-planting became imperative. This work was carried out first by the private individual—the runholder, the farmer, and more recently private companies; secondly by the State—in the first place the Provincial Government, the Lands and Survey Department, and the Railways Department, and then the State Forest Service; and thirdly by local bodies such as the county councils, the Selwyn Plantations Board, and city and borough councils.

PLANTING BY PRIVATE OWNERS

Among the first of those who planted trees extensively, to mention only a few, were the Deans Brothers, the Rhodes, the Hon. J. B. A. Acland, and Mr. T. W. Adams.

William and John Deans settled at Riccarton, close to Christchurch, in 1843, and had at their door one of the very few limited taxad forests which then existed. Though not faced with the shortage of timber which was so acute elsewhere, once established they immediately began to obtain and plant such trees as the silver birch, oak, elm, ash, beech, lime, alder, cherry, and others with which they had been familiar in the Homeland. In the deep moist soil of Riccarton these trees thrived and eventually reached noble proportions. A pear tree planted in 1843 is still in good health and bearing crops of fruit. Among the several fine specimens growing at Riccarton two must have special mention: The true Himalayan **Abies pindrow,** and a magnificent pendulous-branched lime tree, **Tilia vulgaris.**

Several of the trees, now noble specimens, were given to the Deans family by that great imperialist Sir George Grey, who was governor of the colony from 1845 to 1853 and from 1861 to 1867. In 1896 a grove of oak trees was thinned out, and four years later the timber from these thinnings was used for the panelling of the new residence which now stands at Riccarton. Later, in 1850, John Deans began the systematic planting of forest trees on his property at Homebush, near the western foothills, and records were kept of the trees planted and the progress made. The larger plantations, however, were put in between 1870 and 1885 by Mr. James McIlraith, under the direction of Mrs. John Deans, whose husband died in 1854. His brother

William also lost his life by drowning in 1851. In all some fifty species and varieties of trees were planted for forestry purposes and to ascertain which would be the best for timber under local conditions.

IMPORTATIONS BY RHODES FAMILY

In 1850 Robert Rhodes (the father of Sir Heaton Rhodes), with his two brothers, William and George, settled at Purau, Lyttelton Harbour. They came from Australia and brought with them, or afterward procured, seeds of Australian trees, among the first of which were the eucalypts, chiefly **Eucalyptus globulus,** various species of acacias, and casuarinas. Sir Heaton, now in his eighty-sixth year, assured me that a specimen of the stone pine **(Pinus pinea),** and such fruit trees as the walnut, loquat, mulberry and pomegranate, were big specimens when he was a boy. He distinctly remembers a pair of bullocks attached to a sledge colliding with a **Cupressus macrocarpa** about 10 feet high in 1867—79 years ago.

In 1865 Robert Rhodes began to lay out and plant the spacious grounds and garden at Elmwood, Christchurch. Most of the magnificent specimen trees which are still to be seen at Elmwood were planted in 1867. His brother George, who had taken up land at the Levels, has stated in his book, "George Rhodes of the Levels," that Robert Rhodes, when building Elmwood, "introduced many species of plants, including 12 varieties of conifers from San Francisco, of which few, if any, had previously been seen in New Zealand," and that in 1855-56 considerable planting was carried out at the Levels, many varieties of trees being sent from Purau. "One consignment forwarded by Robert consisted of 50 apples, 10 plums, 4 cherries, 25 nuts, 5 lauristinus, 4 walnuts, 4 peaches, 3 mulberries, 3 filberts, 2 pomegranates, 1 nectarine, some hawthorn plants and gum seeds."

In 1894 Sir Heaton began to plant the now beautiful grounds at Otahuna, at the base of the Port Hills immediately overlooking the village of Tai Tapu with the plains beyond. Ably assisted by his enthusiastic gardener, the late Mr. A. E. Lowe, he obtained many rare trees from overseas. Among them were the willow-leaved oak **(Quercus phellos),** the hop tree **(Ptelea trifoliata),** and zelkovas **(Arctostaphylos pungens).** Here also are some fine specimens of **Abies (Picea) alba (pectinata) glauca, Picea (Abies) Smithiana (Morinda), Quercus conferta** and **Quercus coccinea.** In a sheltered valley, growing among a mixture of other trees, are some fine specimens of deodars, which, because of the competition of their neighbours, have not developed lateral branches but have clean, straight trunks which would delight the eye of any forester.

CONIFERS AT MOUNT PEEL

About 1859 Mr. (later the Hon.) J. B. A. Acland began to plant his homestead at Mount Peel, in the Geraldine County near the headwaters of the Orari River. The deeper soil and heavier rainfall of the foothills of this locality as compared with the somewhat arid conditions of the plains were more conducive to tree growth, and here are to be seen some of the finest specimens of such conifers as the Wellingtonia and Douglas fir in the Dominion. Mr. Acland came to New Zealand from Exeter, England, and it was from Veitch's of Exeter that he obtained many of his supplies. In 1859 a seedling of Douglas fir **(Pseudorsuga taxifolia)** was imported, but seedlings of Wellingtonia imported at the same time died on the voyage. The following is an extract from a letter sent from Mr. Veitch to Mr. Acland and dated November 15, 1861:

> "I am sending by a bearer a small basket containing a plant of **Lapageria rosea** and two plants of forget-me-not in two varieties, **Myosotis palustris** and **M. azorica.** I have also sent a packet of 200 deodar seeds fresh imported from India and a small packet of imported Wellingtonia seeds from California for your acceptance."

The seeds were sown and the resultant seedlings planted out; they are now represented by some really magnificent specimens. In September, 1924, Mr. W. W. Smith, of New Plymouth, stated in a letter to the "Lyttelton Times" that:

YEW TREE (Taxus baccata) growing over the graves of William and John Deans in the Barbadoes Street Cemetery, Christchurch. The headstone bears this inscription:

"In memory of the brothers William and John Deans, of Riccarton, the pioneers of colonisation on the Canterbury Plains, who both died at the age of 34. William was drowned on 23rd July, 1851, and John died on 23rd June, 1854."

Alongside is buried the wife of John Deans:

"In memory of Jane, wife of John Deans, Riccarton. Born at Auchenflower, Ayrshire, Scotland, April 21, 1824, and married in New Zealand 1852. Died at Riccarton 19th January, 1911, aged 87. Greatly loved for her many virtues, she lived a noble Christian life and left behind her a gracious and endearing memory. Erected as a tribute of respect and affection by Ayrshire friends in Canterbury."

"When I entered the service of the late Hon. J. B. A. Acland at Mount Peel in 1876 the trees planted in 1850 had made rapid and uniform growth. . . . In 1878 an Indian cedar **(Cedrus deodara)** growing in the garden bore five fruitful cones from which I procured several seedlings. The forest tree, one of the pioneers of its race in New Zealand, had attained a diameter of 2 feet 2 inches four feet from the base."

Sir Hugh Acland states that it is doubtful if many trees were planted as far back as 1850, but Mr. Smith stated that in 1878 **Cedrus deodara** had obtained a diameter of 2 feet 2 inches four feet from the base; it is difficult to imagine trees making such growth in less than 28 years.

From his diary it is ascertained that in 1865 several species of conifers, including pinus, abies, piceas, cedars, cryptomerias, retinosporas, taxus, junipers, larch, libocedrus, thuyas, and thuyopsis had been imported and planted out by Mr. Acland. Some of these were obtained as young plants from Shepherd's nursery, Sydney. Seeds and plants of the following were imported from Veitch during the sixties:—

Abies canadensis (now Picea glauca (alba)).
Abies excelsa (now Picea abies (excelsa)).
Abies Menziesii (now Picea sitchensis).
Abies orientalis (now Picea orientalis).
Cedrus atlantica.
Cedrus deodara.
Chamae cyparis (Cupressus) lawsoniana.
Juniperus communis.
Juniperus virginiana.
Picea pinsapo (now Abies pinsapo).
Picea pectinata (now Abies alba (pectinata)).
Pinus Benthamiana (now P. ponderosa).
Pinus canariensis.
Pinus Jeffreyi (P. ponderosa var. Jeffreyi).
Pinus halepensis.
Pinus muricata.
Pinus Lambertiana.
Pinus pinea.
Pinus tuberculata (now P. attenuata).
Pinus sylvestris.
Pinus Nordmanniana (now Abies (Picea) nordmanniana).
Sequoia sempervirens.
Taxus baccata.
Thuya gigantea (Lobbii) (now Thuja plicata).
Thuya occidentalis.
Tilia vulgaris.
Robinia pseudo-acacia.

Of these trees, all but **Cedrus atlantica** grew.

During the same period (1866) the following plants were obtained from Sydney:—

Abies Khutrow (now Picea Smithiana (morinda)).
Abies Smithiana.
Abies Bermuda (?).
Abies coerulea (probably Abies concolor).
Pinus insignis (now P. radiata).
Pinus longifolia (now P. Roxburghii).
Pinus sabiniana.
Cephalotaxus sp.
Libocedrus chilensis.
Taxus japonica (now Cephalotaxus drupacea var. fastigiata).
Araucaria Cunninghamii.
Araucaria Bidwillii.
Thuya falcata (?) (probably a variety of Thuja orientalis).

also the weeping ash, double flowering cherries, and sycamore. From Abbot's nurseries, Christchurch, several species of pyrus were obtained, among which were **Pyrus aria,** the whitebeam; **Sorbus (Pyrus) aucuparia,** the rowan; **Malus (Pyrus) pumila,** the crab-apple; **Sorbus (Pyrus) domestica,** the service tree; **Sorbus (Pyrus) intermedia,** the Swedish whitebeam; **Sorbus latifolia,** the service tree of Fontainbleu; and **Sorbus (Pyrus) torminalis,** the wild service tree.

Tribute must be paid to the enterprise and endeavours of those early pioneers who at their own expense imported many of the trees and shrubs whose progeny have been distributed to all parts of the Dominion, especially when it is recognised that a voyage from England by sailing ship took as long as three months and there were no refrigerators or cool storage. The plants had to be carefully packed and shipped in Wardian cases, and must have required considerable attention on the journey, especially through the tropics. One can imagine the patient care given to the young plants on their arrival and how they were protected and nurtured in the endeavour to acclimatise them in their new environment.

FIRST PLANTING ON POORER SOILS

Probably the first man to plant extensively on the drier and poorer soils characteristic of parts of the plains was the late Mr. T. W. Adams, who in 1865 was one of the first farmer settlers in Greendale, which is some 500 feet above sea level, 30 miles west of Christchurch and about nine miles from the base of the Malvern Hills. Though much of the land in the district is good wheat-growing country, Mr. Adams established his plantations on the lighter, shingly land. More or less as a hobby, he first interested himself in fruit trees and at one time had under cultivation no fewer than 500 varieties of apples. As an experiment he grafted 50 varieties of apples on to a single stock with which all the scions united. A few years later they all bore fruit, 30 varieties concurrently. To support 50 different sorts on one root system was just too much for Mother Nature, and the more robust types suppressed the weaker. Eventually the remaining dominant variety was one known as Yellow Belle Flower, which, in addition to bearing reasonably good crops of fruit, was valued for its beautiful blooms.

Realising the need for shelter and the importance of timber trees for the future, Mr. Adams quickly turned his attention to experimental tree planting. Not content with seeds and young plants then offering in the colony, he endeavoured to obtain and try out at Greendale every timber tree procurable from the temperate regions of the world—Europe, the Himalayas, Japan, China, Canada, the U.S.A., South America, Australia, and South Africa. He also imported many of the lesser-known trees and shrubs from Barbier of France and Veitch's of England. He was a regular correspondent with such well-known authorities as the late Professor Sargent of Harvard University, the Arnold Arboretum, and the late Dr. Henry of Dublin. Any tree that was reputed to be useful for timber and had a reasonable chance of success in the conditions of Greendale was, if procurable, given a fair trial.

For instance, reading glowing accounts in an American journal of the value of **Catalpa speciosa** as a timber tree, alleging that it would produce more timber of a better class in a shorter time than any other tree that could be grown, he obtained it and tried it out not once but several times. It had been stated that this **Catalpa** would produce in 10 years timber of sufficient dimensions for telegraph poles; Mr. Adams stated that his 10-year-old specimens would hardly supply a walking stick. However, not content with his own experience he sought further information from the proper quarters in America and received the following reply:

> "As you say, a good many people have **Catalpa** on the brain. It has been too much advertised in this country, and though it grows rapidly and is a valuable timber tree in rich moist soil it amounts to very little on the poorer and drier soils."

PERSISTED DESPITE FAILURES

As was to be expected, Mr. Adams had many failures, but, convinced that his work was of great importance not only to himself but to the whole of the province, he persisted to the end. In 1905 he had about 1,000 species and varieties of trees and shrubs established in his plantations at Greendale, including many species of gums **(Eucalyptii),** wattles **(Acacias),** pines, spruces, poplars, willows, and oaks; several species of elms, birches and ash; and numbers of cedars, cypresses, beeches, limes, hickories and walnuts. In one collection were some 48 species of oak and more than 50 species of pine—no mean collection for that time, more than 40 years ago. It is doubtful if such a comprehensive collection could be found in any of our gardens or plantations to-day.

Writing in later years of his experimental plantations, Mr. Adams made the following comments:

> "The number of trees that will be found quite reliable on the Canterbury Plains either for use or ornament is likely to be reduced to a comparatively small number. The extreme droughts of our summers and the occasional severe frosts of our winters have the effect of considerably limiting the number of trees available. Of course many not adapted for general planting may be successfully grown to a limited extent where the better conditions of moisture or shelter are to be had." [It is doubtful if we have a single species of spruce **(Abies)** that can be grown successfully for profitable timber.] "The pine family seems better adapted to withstand the extremes of our seasons, and several of them grow rapidly while others, though growing slowly, give promise of success. The one showing the most failures is the Scots pine **(Pinus sylvestris);** from its known value as a timber tree in Europe it was planted early in large numbers, but they are now to be seen in many places, the most unsightly objects that can be imagined."

In a select list of pines he recommends for general planting the following: **Pinus Coulteri, P. radiata (insignis), P. nigra (larcio), P. muricata, P. attenuata (tuberculata), P. ponderosa, P. nigra (austriaca), P. contorta (Bolanderi),** and **P. Fremontiana.** (The last is synonymous with **P. cembroides var. edulis).** With the exception of the last two species these pines are more or less common in the early plantations established throughout Canterbury. Of the cypresses, those reported as showing the most promise were **Cupressus macrocarpa, C. lusitanica var. Benthamii, C. lusitanica var. Knightiana, C. torulosa,** and **chamaecyparis (cupressus) Nootkatensis.** Most of the junipers were also recommended, and of the deciduous trees the oaks, the lombardy poplar, the English maple **(Acer campestre),** the box elder **(Acer negundo),** the elms, and some others were considered the best to withstand the general conditions of the plains.

(Dallimore in his handbook of coniferae gives **Cupressus Knightiana** as synonymous with **C. Benthamii,** which is given as a variety of **C. lusitanica.** Plants raised from seed of this species imported from the U.S.A. by the writer showed a considerable variation in form. Dallimore states that it is a tree varying greatly in habit.)

TRIALS WITH INDIGENOUS TREES

Mr. Adams also gave attention to our indigenous trees. New Zealand trees were given fair trial along with exotics, but, apart from the kowhai, the matipo **(Pittosporum tenuifolium)** and the totara, most of those tried proved unsuitable. The following extract is taken from the records of Greendale:

> "There will be found in the list of trees and shrubs growing here about 50 species of native plants, but not one of them could be recommended for profitable cultivation when compared with other trees that have been introduced, and for ornamental planting they are more singular than beautiful."

Such a statement may be indignantly refuted by some of our native flora enthusiasts, but Mr. Adams was giving his considered opinion of those trees and shrubs suitable for the trying conditions to be met with on many parts of the plains, and not for the more congenial conditions in the coastal regions and foothills. In some of the localities, such as Greendale, frosts are sometimes severe enough to kill or affect seriously such supposedly hardy subjects as the cabbage tree and manuka scrub.

At his death in 1919 Mr. Adams bequeathed to the Canterbury College Board of Governors his plantations at Greendale, consisting of about 98 acres of land, and £2,000 for the encouragement of the science of forestry and the investigation of problems. Dr. Cockayne, in his obituary notice of Mr. Adams published in the "Transactions of the New Zealand Institute", states that: "His Greendale estate possesses not only fine mixed plantations, but easily the largest collection of living specimens of exotic trees and shrubs in New Zealand, representing, not unworthily, the hardy tree and shrub flora of the world."

LATER EXPERIMENTS

Some mention should also be made of two enthusiasts who carried out experimental planting at a later period—the late Dr. Leonard Cockayne and the late Mr. Orton Bradly.

Dr. Cockayne imported many seeds of trees and shrubs from overseas. These he raised and established in his garden of more than four acres at New Brighton, from where, as they became large enough to transplant, he generously gave them to neighbouring local bodies. As a member of the Christchurch Beautifying Society he gave to the city and planted with his own hand many fine ornamental trees which now grace the reserves along the River Avon.

At Charteris Bay, one of those warm, sheltered valleys of Lyttelton Harbour, Mr. Bradly concentrated his efforts on the importing and establishing of many of the more tender exotics which he expected would thrive

PINUS RADIATA (insignis) planted in marram grass which had been set out on shifting sand dunes twelve months previously.

CORSICAN PINE (Pinus nigra var. calabrica (laricio)), 22 years after planting in sand dune country.

[Green and Hahn photo.

under the milder conditions there. At his own expense and by his own efforts he established many plantations of eucalypts on the roadsides between Teddington and Purau. His garden contains several fine specimens of such subjects as **Eugenia Smithii, Cinnamomum camphora, Erythrina insignis, Ochna multiflora, Cerotinia siliqua, and Sterculia (Brachychiton) sp.**

CURATORS AND NURSERYMEN

It has been stated on reliable authority that Canterbury has a greater variety of trees and shrubs than any other province in New Zealand. If so, it must be everlastingly grateful not only to the efforts of those men already mentioned but also to those associated with the early establishment and control of Hagley Park and the Christchurch Botanic Gardens. Mr. Enoch Barker, the Armstrongs (father and son), the late Mr. A. L. Tayor, and the late Mr. James Young, successive curators of the Christchurch Domain, imported and established the many fine trees and shrubs which have made that place famous. The early nurserymen at considerable expense imported plants from every available source and retailed them to the public, often at a price that barely covered the cost of importation and acclimatisation.

The late Mr. Robert Nairn dealt adequately with the activities of the nurserymen in his address, "The Early History of Horticulture in New Zealand", delivered as the Banks Lecture before this institute in 1932.

PROVINCE'S FIRST NURSERYMAN

Some mention, however, is due to the first nurseryman of Canterbury, Mr. William Wilson, who established a nursery in Christchurch in what is now one of the heavily-built parts of the city. In his nurseries, covering more than 19 acres, Mr. Wilson propagated many of the trees now distributed over all parts of the province. A descriptive article on his nurseries, claimed to have been written in 1863, states that growing in it were "large stocks of apples, pears, plums, peaches, nectarines, figs, filberts, medlars, quinces, and almonds." Among the trees were "large numbers of English oaks, and mossy cup oaks **(Quercus macrocarpa),** English and American lime trees, horse chestnut and sweet chestnut, hornbeam, the common and purple-leaved beech, willows, lombardy and black Italian poplars, birch trees, laburnums, the locust

tree **(Robinia pseudo-acacia)**, Norway and other maples, sycamores, **Platanus orientalis** (the first so far as we know which have been grown in New Zealand), **Ailianthus glandulosa, Gleditschia tricanthos,** bluegums and acacias." The conifers were mostly grown in pots and included many thousands of **Pinus pinaster,** "which will yet clothe with luxuriant green the slopes and summits of our dry and even shifting sandhills," **P. sylvestris,** cedars, cypresses, spruce, and arborvitaes **(Thuyas).** Among the ornamental shrubs were quantities of green and variegated hollies, laurels and laurustinus, **Aucuba japonica, Wistaria sinensis, Photinia serrulata, Diervilla (Weigela) sp., Cydonia (Pyrus) japonica, Spiraea corymbosa** (possibly **S. japonica), Rhus toxicodendron,** berberis, pomegranates, **Buddleja (Buddleia) globosa,** varieties of thorns **(Crataegus spp.),** box, lilacs, and the osage orange **(Maclura pomifera (aurantiaca)).**

It was the love for plants that inspired the nurserymen more than pecuniary gain. In 1914 Nairn and Sons imported £1,000 worth of trees and shrubs from Europe. Because of delay and other difficulties the whole consignment was practically worthless on arrival. Instead of bewailing his loss, Mr. Robert Nairn imediately cabled duplicating the order. His father, Mr. David Nairn, once remarked: "If my son Robert would only stop importing I would be able to pay my debts."

To those genuinely interested in beautification and planting the nurserymen were ever ready to assist with gifts and advice; many a rare plant was given to those who would appreciate its value and give it the treatment that it merited. Import restrictions, the rate of exchange, and the war have restricted importations of recent years, but better times lie ahead, and there are still such enthusiasts as Messrs. Edgar Stead, P. J. Skjellerup and others who have done much during the past decade or so to procure and produce many of the lesser-known and beautiful shrubs and trees which are now becoming more popular throughout the Dominion.

WORK OF LOCAL BODIES

With closer settlement came the small farmer—the "cockatoo" or, more familiarly, the "cocky." Farming changed from purely pastoral to agricultural, or a mixture of both. With the tilling of the soil, still more trees were required for shelter. The howling north-westers would raise great dust storms from land under cultivation or flatten out the ripening crops. Denuding of the soil and the loss of crops could not be allowed to go on indefinitely. A still more vigorous policy of tree planting was adopted and further encouragement given to owners and lessees to plant. In 1858 the Provincial legislature passed an ordinance granting to the planting lessee title to trees planted on leasehold property. Still further encouragement was given to the private planter in 1871 when the general Government passed the "Forest Trees Planting and Encouragement Act," which granted the freehold of two acres of land free for every acre of freehold land successfully planted, such grants being limited to from 20 to 250 acres. Under this Act considerable areas were granted on the plains of Ashburton County.

To encourage local bodies to plant areas of forest trees, the Act was amended in 1879 to give local bodies the same powers and privileges as private persons under its provisions, and they "were empowered to appropriate such portion of their funds as they might think fit for the planting of forest trees." Under this Act and its amendments was built up the system of local body plantations, now one of the chief assets of Canterbury. Selwyn, Ashburton and Mackenzie Counties obtained control over extensive areas of plantation reserves which were planted, as circumstances and funds permitted, with exotic forest trees, mainly American conifers and Australian eucalypts.

SELWYN PLANTATIONS BOARD

One of the most important of local bodies entrusted with the establishment and management of plantations on the Canterbury Plains is the Selwyn Plan-

tations Board. Though the board was not constituted until 1911, at its inception it inherited many flourishing plantations and public reserves. From about 1879 until 1886 the afforestation of public reserves from the Hurunui in the north to the Waitaki in the south was carried out by a special Provincial Plantations Board. The main planting activities, however, were confined to the old Selwyn County and Ashburton County.

The following extract is from the minutes of the old Selwyn County Council of April 25, 1879:

> "That the council will supplement the funds of the Provincial Plantations Board to the extent of £500 to be charged against the road districts in which it may be expended."

During 1881 extensive planting was carried out in all public reserves throughout the province of Canterbury. In 1886 the public plantations and reserves on the plains between the Waimakariri and Rakaia rivers were handed over to the management of the Selwyn County Council, which had jurisdiction over all this vast area; all those south of the Rakaia to the Rangitata were placed under the control of Ashburton County, the remainder being administered by the Lands and Survey Department. Twenty-four years later, in 1910, the Selwyn County Council was dissolved and the area it controlled divided into a number of smaller counties as they are constituted to-day—Selwyn, Malvern, Springs, Ellesmere, Heathcote, Waimairi, Halswell, Paparua, and Tawera County Councils. Instead of one large county, nine were created—somewhat of a paradox in view of the principle of local body amalgamation which is advocated at present.

Fortunately the administration and management of the public plantations and reserves, aggregating 15,751 acres distributed throughout these counties, was entrusted to a separate body designated the Selwyn Plantations Board, which consisted of the Comissioner of Crown Lands for Christchurch as chairman, and as members representatives from each of the counties and one from the Borough of Spreydon, which in 1921 amalgamated with the City of Christchurch, thus giving it in turn the right to appoint one representative. The representative of Spreydon Borough and then for the City of Christchurch was Mr. Robert Nairn, who served continuously on the board from its inception until his death in 1938, a period of 27 years.

The first meeting of the newly-constituted board was held in May, 1911. It began operations with a credit of £3 5s 6d. About this time, however, the annual revenue accruing from rents, etc., amounted to approximately £1,100. Last year its income from rents, timber and firewood sales, and milling royalties was £8,925. It has approximately £21,400 invested in Government stocks and with other local bodies. Its assets are set down at £115,296 10s 5d, and it now administers some 18,100 acres of plantations and reserves. Last year it produced 2,963,853 superficial feet of insignis pine **(Pinus radiata)** timber and 8,598 feet of gum (Eucalyptus) and macrocarpa **(Cupressus macrocarpa).** In addition it sold more than 2,500 cords of firewood and many thousands of stakes and props.

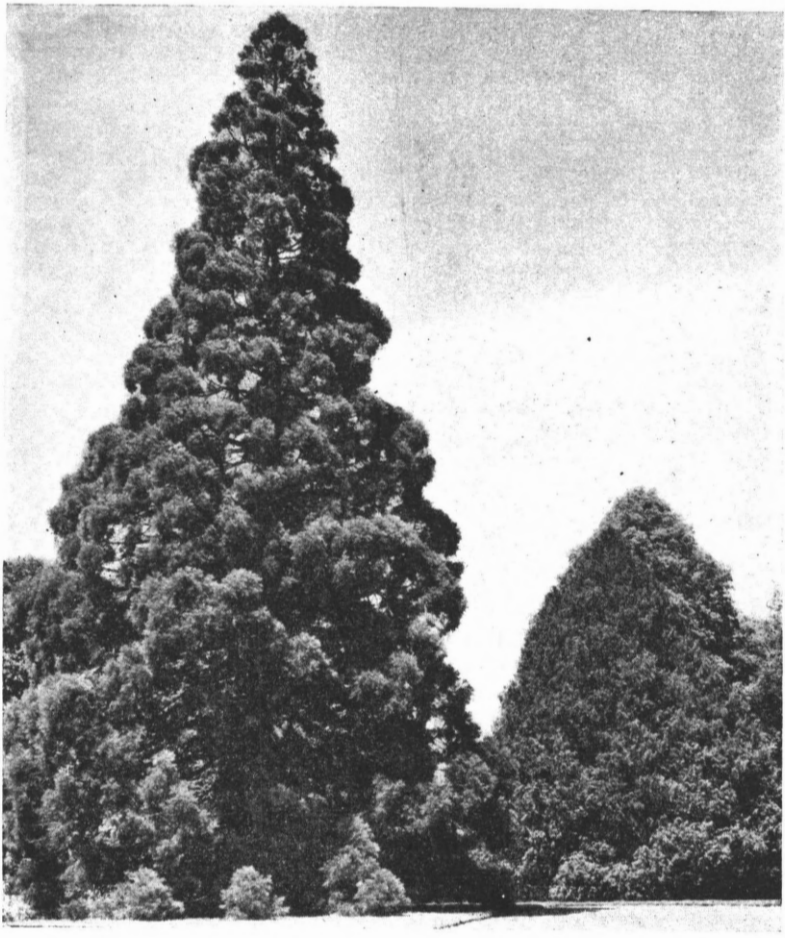
PLANTATIONS FOR SHELTER AND TIMBER

The first plantations were established primarily for protection—to act as shelter belts from the strong winds which sweep across the plains—and, secondly, to assure a supply of timber for the future. The present policy of the board is to develop the commercial side to an even greater extent without losing sight of the necessity for protection.

To manage its plantations the board first appointed Mr. D. McIlwraith at a salary of £200 a year. At the same time the Government appointed Mr. R. G. Robinson, of the Forestry Branch of the Lands Department, "to co-operate with the board in the carrying out of its functions." Nine years later Mr. Robinson was appointed superintendent, which office he held until his retirement in 1938. He still acts in an advisory capacity.

Of the subjects used in some of the earliest plantations, eucalyptii and acacias predominated. The eucalypts flourished amazingly and gave promise of excellent results for the future. Then came the insect pests in great numbers—scale insects, weevils, gall flys, and leaf-cutting insects—which by their persistent attacks undermined the vitality of the trees, making them mere debilitated specimens or gradually killing them altogether. The blue gum, **Eucalyptus globulus,** was particularly susceptible to attack, but some species showed greater immunity, the two foremost being **E. viminalis** and **E. MacArthuri.** Exceptionally severe frosts which might occur only every 25 years or so also took severe toll of the gums.

Of the acacias, or more familiarly speaking the wattles, Acacia decurrens var. dealbata was largely planted, but it has proved of little value except for firewood and shelter. The Californian conifers, however, excelled, and Pinus radiata was soon recognised as the tree most suited for general planting throughout the plains.



SEQUOIA WELLINGTONIA, planted in 1868 in Elmwood, Christchurch.

SEEDS BROUGHT IN BY MINERS

No definite information can be obtained of when it was introduced and who was responsible for the introduction of this remarkable pine, plantations of which have become one of the chief characteristics of our landscape. Some authorities consider that the goldminers, who, lured by the rich finds first in Australia and then in New Zealand, flocked to these countries from all parts of the world, brought with them seeds of trees of their countries. Among the diggers were large numbers of experienced miners from California, who introduced such western conifers as **Pinus radiata** and **Cupressus macrocarpa.** This belief is supported by the fact that some of the first plants of both trees reached New Zealand from Australia, where many of the Californian miners had sojourned until the gold rush broke out in this country during the fifties and sixties. In many of the abandoned mining camps in Otago and on the West Coast are specimens of western conifers, as well as other trees, which must have been planted by the miners who at one time populated these now-deserted localities. In 1864-1865 potted trees of Californian conifers arrived in Canterbury from Australia and some of them were reputed to have sold at three guineas each. However, certain **insignis** pines planted at Mount Peel were imported from Sydney in 1863 at 4s 6d each. A little later it was possible to import seeds of these conifers from Australia.

The following information about the raising from seed and planting-out of these trees was obtained by Mr. C. E. Foweraker from Mr. Norman McFarlane of Christchurch:

> "At the Albury Homestead, South Canterbury, the first seed sown was that of the **insignis** pine in 1868. Seed was rather scarce so considerable care was taken. Ground was carefully prepared and the seeds dibbled in four inches apart, and from having so much room grew sturdily. The seedlings were then lined out in a nursery and finally planted out. Some were planted out in holes already dug, but these proved a failure because of bad drainage. Those put into land that had been subsoil ploughed proved a great success."

The practice of breaking up and cropping the land in readiness for planting with trees appears to have been not uncommon in the early days. Sir John Hall, who carried out much pioneer planting work in the Hororata district, made several offers, which were accepted by the Selwyn County Council, to break up and cultivate with turnips areas up to 80 acres and more in readiness for planting with trees the following year. Tenders were also frequently let for the ploughing and cultivating of extensive areas in readiness for planting out young trees and for the sowing of gum seed.

ASHBURTON COUNTY

Ashburton County controls 5,300 acres of plantation reserves and derives an annual average revenue of approximately £5,000 from rents and the sale of timber. The chief timber trees grown are **P. radiata** and some eucalyptii on the plains, and larch and Douglas firs on the higher country toward the foothills. Unlike the Selwyn Plantations Board, the county does not possess its own nursery; most of the planting is carried out under contract, and the plants are supplied by Messrs. Millichamp and Son, of Tinwald, Ashburton. This nursery firm is possibly one of the largest and most successful raisers of forest trees in the Dominion.

CHRISTCHURCH CITY COUNCIL

Under the Borough of Christchurch Reserves Act of 1878 and 1884, the council was granted 1,333 acres at Bottle Lake and a further 1,100 acres at Chaneys. These reserves were situated on almost pure littoral sand-dune country covered with a sparse vegetation of manuka scrub, bracken, and grass. Both reserves were let as sheep runs. At Bottle Lake the sheep denuded the surface of its natural covering of grass and fodder plants which

bound the unstable surface together. Stripped of this protection, the sand began to break away and drift inland, threatening the better-class land to leeward. As a preventive, and with a view to establishing a communal forest, the council began planting experimental blocks between 1909 and 1912, the trees used being **Pinus nigra var. calabrica (laricio), P. nigra (austriaca), P. ponderosa, P. muricata, P. pinaster,** and the Norway spruce, with protective belts of **P. radiata** round their margins. It was soon realised that **P. radiata** was particularly suited for the sand-dune country, and in 1916 it became the main tree for general planting. Attempts were made later to establish the Douglas fir, the redwood **(Sequoia sempervirens),** the western red cedar **(Thuja plicata),** the pitch pine **(Pinus Banksiana),** various eucalypts, the oak, and some others, but these and the spruce all proved miserable failures on the low maritime sand-dune country. **Pinus nigra var. calabrica (laricio)** is showing good promise, but its rate of growth is only half that of **P. radiata.**

By purchase the city council has extended its original reserve at Bottle Lake to more than 2,000 acres. For the past eight years the revenue from timber and firewood has shown a considerable profit over working expenses. Last year, for example, a few acres of standing **Pinus radiata** sold on a royalty basis of 6s 6d a hundred superficial feet netted £260 an acre—quite good for trees not more than 28 years old.

At Chaneys the continual grazing of sheep has brought about the same conditions of erosion as occurred at Bottle Lake, and the council has adopted a policy of taking 100 acres a year from the lease and planting the area taken with forest trees, **Pinus radiata.** Following the Continental practice, the trees in the first plantation were spaced four feet apart, which meant 2,720 trees an acre. With the fast-growing **P. radiata** this distance proved much too close, especially on poor soils, unless a systematic and rigorous policy of thinning was carried out from the time suppression started, which would be approximately nine years after planting. Later the planting distance was increased to six feet, then to eight feet, and again to nine feet. Experience has shown the eight-foot spacing to be the optimum distance apart for **P. radiata.**

The council also possesses several hundreds of acres of plantations at New Brighton, the original trees of which were planted by the old Selwyn County Council when the borough was part of that county. Two **Pinus radiata** felled last year and estimated at 53 years old yielded about 8,000 superficial feet of timber, which sold, in log lengths on the ground, at 9/- a hundred feet and produced a revenue of £32.

From the same plantation some straight, clean macrocarpa, growing in association with the pine, yielded excellent timber which is now being used for building and has been pronounced as good as rimu. The only regret is that there is not more of it.

SPECIES IN VICTORIA PARK

The council also controls extensive reserves on the Cashmere and Port Hills overlooking Christchurch and the plains. At Victoria Park, of 188 acres, a great variety of trees and shrubs from all parts of the temperate zones is being established, as well as many representatives of indigenous flora.

Cedrus atlantica: Seed of this tree, obtained over a number of years from the parent trees in Mr. Deans' plantations at Homebush, has shown good germination. Three-year-old seedlings planted out in tussock and heavy grass on the steep hillsides showed very slow growth for the first few years, after which their progress, though never attaining the phenomenal growth of **Pinus radiata,** was comparatively rapid and very uniform. Fifteen-year-old trees now have an average height of 24 feet and have made almost double the growth of **Chamaecyparis (Cupressus) lawsoniana** of the same age and planted under the same conditions. So far the trees appear to be immune from the effects of parching and bitter winds and from insect pests.

Cedrus Libani: A close ally, the Lebanon cedar, is also showing good promise. Plants obtained from seed imported from Europe 12 years ago all showed a stunted and bushy tendency at the nursery in Linwood, but when some of the more forward were transplanted to the hillsides about 700 feet above sea level they made more rapid growth and developed a true upright leader. The higher altitude and the difference in soil conditions may have been responsible for this difference. Magnificent specimens of these two cedars, as well as of **Cedrus deodara,** are to be found in some of the older plantations established in the sixties and seventies by the first landholders.

The Spruces: The blue Colorado spruce **(Picea pungens var. glauca), Abies concolor, Abies Veitchii,** and others, all show good promise, and in moister, higher country such as at Hanmer should do even better.

Pinus halepensis: For poor soil and very exposed positions subjected to the continual buffeting of winds, the Aleppo pine thrives exceptionally well.

DEODAR (Cedrus deodara) at Elmwood. The grounds were planted in 1865 by Mr. Robert Rhodes, father of Sir Heaton Rhodes.

At Godley Heads, the bleak promontory at the entrance to Lyttelton Harbour, this tree has made more uniform growth than any others. It is true that **P. radiata** has exceeded it in dimensions, but it is so subject to wind damage in such an exposed position that the appearance is not comparable with that of **P. halepensis.**

Pinus Mugo (montana): The Swiss mountain pine and its varieties, though of no economic value, have proved of value for planting on exposed ridges and rocky faces where cover and low shelter were required.

Cupressus arizonica and Elaeagnus angustifolia: This cypress is of more recent introduction, and is being recommended for shelter belts on poor soils subject to drought. Of a number of conifers planted in the open at Victoria Park, this tree was the only one with which sheep did not interfere.

Elaeagnus angustifolia, a small deciduous tree from Asia Minor and Siberia, with silvery foliage and heavy spines, is being used for rehabilitating denuded areas of the U.S.A. It appears to be immune from the effects of extreme

heat and cold, is stock-proof, and seems to thrive equally well in the waste sand dunes at sea level and in the dry exposed faces of the Port Hills 900 feet above sea level.

Victoria Park is composed of pure tussock country, and in the knowledge of man never grew trees before.

WAIMAKARIRI RIVER TRUST

Though early Governments did encourage the planting of forest trees, there is, unfortunately, another side to the picture. The high-country sheep runs, and those back in the mountains, were mainly held under lease granted by the Crown. "In demarcating these mountain sheep runs it was the practice of the Lands Department's surveyors to mark in on their maps areas of forest or bush-clad country and barren land. These were deleted from the gross area of the run as being unfit for grazing, and the rental fixed on the basis of the net grazing area." As was to be expected, the runholder made free use of these State forests for the shelter of his stock, for firewood, and for fencing materials. "Accidental" fires reduced the size of these natural forests, while the runholder expanded his grazing area at no extra rental.

This, however, was by no means the worst aspect. The reduction of the forest or bush, coupled with the burning-off of tussock and the depredations of animals, stripped the mountain sides of their natural protection and provided a quick run-off for rain and melting snow, with the result that the steeper slopes in a comparatively few years became huge, bare, shingle slips pouring masses of stone and detritus into the rivers and spreading over the better tussock land in the bottom. The rivers rapidly became choked, and large sums of money have been and still are being spent on their control.

The need for river protection brought into being the Waimakariri River Trust, which, among its other operations, has to date planted in the dried-up riverbed country of the Waimakariri approximately 3,000 acres of **Pinus radiata** and many thousands of willows of various species along the banks of the streams and in adjacent land subject to inundation and erosion.

TREE PLANTING BY THE STATE

Though the Government of New Zealand encouraged the planting of forest trees for a number of years before 1895, it was not until about that year that it gave serious consideration to the question of a future timber supply. In the following year there was constituted in the Lands and Survey Department a forestry branch, which began the planting of forest trees on waste lands belonging to the Crown.

In Canterbury the first operations began at Hanmer, where a tree nursery was established and planting begun on the waste manuka scrub country which abounded in that district. Clearing and planting were carried out by prison labour. It is reported that "the scheme was regarded by the country at large more as a good healthy means of keeping the prisoners occupied than as a potential asset." In 1913 the use of prison labour ceased, but the work was carried on by the staff of the Forest Service. To-day the area at Hanmer planted in forest trees covers 7,684 acres. The earlier plantations consisted mainly of larch and corsican pine with odd lots of **Pinus contorta var. latifolia (murrayana), P. muricata, P. ponderosa,** and Oregon pine. Later the planting was largely confined to **P. radiata.**

In 1911 the Government, when relotting Mackenzie County runs for a further period of 21 years, made it a condition in the lease that each year one acre with at least 1,000 trees had to be planted, securely fenced, protected, and failures made good. The severity of the winters caused considerable failures, but small though valuable plantations have been established. **Pinus ponderosa** has proved one of the hardiest timber trees for general planting in the colder parts of the county.

STATE FOREST SERVICE

It required the war years of 1914-1918 to bring the people to a realisation of the shortage of timber for all purposes and the possibilities of timber as a source of revenue. As a result, the State Forest Service was instituted in 1921. In addition to interesting landowners in tree planting and the value of timber in the utilisation of waste lands, the service accelerated and widened the scope of its forestry operations. An area of 21,268 acres of almost worthless land at Balmoral is now fully planted, chiefly with **Pinus radiata;** at Eyrewell a further 17,383 acres have been planted; and at Ashley another 1,722 acres have been afforestated. **Pinus radiata** has been the main type used throughout. All of these areas, including Hanmer, are in North Canterbury. These figures represent the acreage planted with trees, and do not include areas still to be afforestated. In addition, the State owns some thousands of acres of indigenous forests, mainly **Nothofagus spp.,** on the mountainous country of the eastern slopes and foothills of the Southern Alps.

RAILWAYS DEPARTMENT

Throughout the plains, particularly along the main trunk railway line, the Railways Department owns considerable reserves in the form of narrow strips bordering the permanent way. In the early days, probably for shelter, long breaks of trees were planted, but, because of lack of the information which only experience could give, several of the types planted were unsuitable for the situations. Those planted were mostly eucalypts, English hardwoods such as the oak and ash, larch and other conifers. The larch proved entirely unsuitable, not only here but elsewhere on the plains, and the hardwoods such as the ash were of little value in the poorer and drier soils in which they were planted.

SUMMARY

From past records it is ascertained that the first plantings on the plains consisted mainly of European trees, the oak, elm, ash, willows, poplars, and others of that nature. These were followed by the Australian eucalyptii, especially the blue gum, which in turn were followed by the Californian conifers, **Pinus radiata** and **Cupressus macrocarpa.** Such trees as the larch, Douglas fir or Oregon, the redwood, the Wellingtonia, and the spruces, have proved unsuitable for the plains in general, but have succeeded on the down country, the foothills, and the higher country, especially where a heavier rainfall is experienced.

Though Pinus radiata will undoubtedly convert air, moisture, and soil into timber more quickly than any other tree, is increasing in value, and will grow in almost any situation, nevertheless if planted in quantity to the exclusion of other trees it gaves a sombre appearance to the countryside.

Up to the present all attempts at afforestation have been confined to the waste and useless lands. No serious attempt has been made yet to grow such trees as the ash and oak on better-class land and under approved sylvicultural control. A few years ago the golden scale threatened the extinction of the European deciduous oaks, but thanks to the efforts of the Cawthron Institute the parasite **Habrolipis Dallii** has brought this menace under control, and many affected trees are again healthy and flourishing. In many parts of the province there are situations, particularly in the gullies of the foothills and down country, where such trees would succeed and show a good return if treated as they should be.

Mr. James Deans (grandson of the first John Deans), who has given a lifelong study to the growth of trees, not only in his own plantations at Homebush but throughout Canterbury, sums up the position as follows:

"**Pinus radiata** is the most useful all-round tree to be grown in New Zealand. Where the average rainfall exceeds 30 inches a year Douglas fir is worth growing. **Cupressus macrocarpa** for general farm usages is a useful tree. Some of the Australian gums, **Eucalyptus Macarthuri, E. regnans,** and **E. obliqua,** do well at Homebush and in similar localities will be valuable in the future. The Atlantic and Lebanon cedars for dry, exposed hill conditions, and the deodar in valleys, are recommended as valuable trees for producing timber of high quality. The redwoods are recommended for the valleys and sheltered places. Of the deciduous trees, the oak and ash will give good results in heavy land, and are making satisfactory progress in many places."

EXOTIC OR INDIGENOUS

Much prejudice has grown up and in some cases been fostered against the timber of New Zealand-grown exotic trees, not only in the Dominion but overseas. There is ample evidence to prove that such trees grown in New Zealand in their proper environment, and subjected to systematic forestry management, will produce most of the timber, and of good quality, required for general purposes. Even the small farm wood lot can be made profitable if the necessary attention is given to the trees and the resultant timber put to its fullest utility.

For landscape effect, and for beautification in varying soils and situations, many kinds of introduced trees have proved eminently suitable. Some of the world's greatest authorities on trees have predicted that trees from other climates and not inured to New Zealand conditions would prove susceptible to disease in comparison with those indigenous to the country. In some respects this contention has proved partially correct, for instance with some of the eucalyptii. On the other hand, **Pinus radiata, Cupressus macrocarpa,** and others have thrived in their new home even better than in their native habitat. The chestnut is generally accepted as a British tree, but it is not truly British, having reached that country from eastern Europe 300 or more years ago. In England many other trees from distant parts of the world have survived the ravages of time.

The same applies to New Zealand. By all means preserve and foster our own flora, but also let us grow the best the world can give. Like our pioneer grandparents we must expect failures. These will be offset with successes. It is our duty to instil a love for trees in the younger generation, and teach them how to appreciate their value not only for their commercial uses but also as an integral part of the community.

DRASTIC TREATMENT

Novel Method of Peeling Fruits and Vegetables.

A NEW method of peeling vegetables and fruits is described in the "Proceedings of the American Society for Horticultural Science" for 1944, page 190:—

"By subjecting lima beans, peppers, potatoes, sweet potatoes, peaches, and apples as quickly as possible to a temperature of from 240 degrees to 250 degrees F. and a pressure of 10 to 15lb., and then creating a vacuum of from 25 to 27 inches by shutting off the steam and rapidly forcing cold water into the retort used, it was possible to remove the skin quickly and with comparatively little waste, ready for canning. A patent has been applied for."

LODER CUP AND COCKAYNE MEDAL
Presentation Ceremony in Christchurch

THE Loder Cup, the Cockayne Gold Medal, and prizes won in the recent garden competition conducted by the Canterbury Horticultural Society were presented in the Christchurch City Council Chamber on the evening of April 10. Mr. J. R. Templin presided over an audience of about 200. The mayor, Mr. Andrews, in presenting the garden competition prizes, said he had been deeply impressed by the high standard set by the winners. "Christchurch is known as the 'Garden City'," he said, "but even with the finest parks, reserves, and botanic gardens in the world it could not be worthy of such a title without the co-operation of the citizens in extending that beauty throughout every part of the city."

The Cockayne Medal was presented to Mr. T. R. N. Lothian by Mr. A. H. Shrubshall, chairman of the district council of the Royal New Zealand Institute of Horticulture. He explained that the medal was in honour of the father of botany in New Zealand, Dr. L. Cockayne, who was also an early president of the institute; it was presented to the student gaining the highest marks in the diploma examinations held by the institute. The institute was very gratified, he said, that the medal had been won by a Canterbury student, for it was acknowledged that this province led the rest of New Zealand in horticultural pursuits.

Mr. Lothian thanked Mr. Shrubshall and acknowledged his debt to the late Dr. Cockayne for much knowledge gained through his writings on the flora of New Zealand.

LODER CUP AWARD

Mr. C. E. Foweraker, whose close association with all the organisations nominating Mr. W. B. Brockie for the 1945 award of the Loder Cup made him particularly well equipped to make the presentation, recounted the great work that Mr. Brockie had done toward the cultivation and preservation of the flora of New Zealand. He stressed the value of Mr. Brockie's work in this field to the institutions with which he was connected, and to students and lovers of the flora.

Mr. Brockie was given a rousing reception, but unfortunately there was no one present to take a verbatim report of his stirring reply. He traced the steps that had led him to the Loder Cup award, and at every step he paused to thank someone who had contributed in some measure to the work he had undertaken. The warmth of the acclamation showed Mr. Brockie how keenly he was appreciated. This was further demonstrated when, after an appeal by Mr. L. W. McCaskill for sufficient ufnds to pay for the publication of a work by Mr. Brockie on **Ranunculus paucifolius,** it was later announced that the amount asked for had been oversubscribed by those present at the meeting.

In recognition of a further signal honour which had come to Canterbury during the past year in the conferring of the Fellowship of the Royal New Zealand Institute of Horticulture on Mr. M. J. Barnett, Superintendent of Parks and Reserves, Christchurch, a motion of congratulation was moved by Mr. J. N. McLeod. The mover referred briefly to the meritorious work done by Mr. Barnett, both in the realm of horticulture and as a citizen. Mr. McCaskill, in seconding the motion, mentioned some of the outstanding achievements of Mr. Barnett's career which made him a leader in horticulture to-day.

Mr. Barnett said he felt the honour to be one for Christchurch as a whole, and in particular a tribute to the members of his staff, who had assisted in bringing to fruition much of what had been planned.

A BY-WAY NEAR CASERTA: The lower branches are removed from pine trees of almost all varieties in Italy. By this means a valuable timber is produced with a minimum of shading to crops. The heads of cereals often brush the bark of the pines.

[F. Sydenham photo.

Suggestions for Improving Education in Horticulture

By N. LOTHIAN, N.D.H. (N.Z.).

Lecturer in Horticulture, Lincoln Agricultural College.

ONE of the greatest thinkers of all times, Lord Bacon, expressed his views on horticulture as follows: "God Almighty first planted a garden, and indeed it is the purest of human pleasures; it is the greatest refreshment to the spirits of man, without which buildings and palaces are but gross handiwork, and a man shall ever see that where ages grow to civility and elegancy, men come to build stately sooner than to garden finely, as if gardening were the greater perfection."

IT seems appropriate to begin a discussion on horticultural education as it affects university colleges with this quotation, as it gives the ultimate object to be striven for—horticulture not only from the utilitarian but also from the aesthetic aspect. It is important that these two objectives be appreciated, and before discussing horticultural education let us first examine the different branches of our profession. Such a survey is necessary before deciding on the best methods for horticultural instruction.

WHAT IS HORTICULTURE?

Briefly, horticulture relates to the cultivation of plants not used for agricultural or pastoral cropping. It is somewhat hard to define, but a broad classification of horticultural activities as they are known in New Zealand will be attempted.

Originally, horticulture referred to the cultivation of plants other than farm crops, and including herbaceous annuals, biennials, perennials, trees or shrubs. More recently it has included the use of glass as an aid to cultivation. Then the cultivation of commercially useful plants was included, and to-day, as evidence of this expansion, the Horticultural Division of the Department of Agriculture, for example, is much more concerned with market gardens and orchards than with ornamentals. So the stage was reached where horticulture was recognised as being concerned with the cultivation of ornamental plants, useful vegetables and fruits. To-day, especially in the applied branches of horticulture, many more sections have been added—for instance, landscape gardening, gardens in relation to public utilities, and advisory services, either public or private.

But the most recent development, that of horticultural research, has still further extended the significance of the term "horticulture". This sphere is concerned not only with the appearance and uses of plants but also with their structure and physiological behaviour. The findings of research workers assist the general horticulturist in growing better plants, be they for the market or for aesthetic purposes.

Several other types of activity should perhaps be included, notably forestry, which, after all, is only arboriculture applied for economic purposes. McCaskill, in this journal of March, 1937, goes so far as to consider that the care and maintenance of national parks, scenic reserves and natural forest lands should also be included. Though there is every justification for doing this, these amenities are more closely related to forestry, and therefore may be grouped with the applied horticultural activities rather than with those activities normally associated with our profession.

It can be realised that great responsibilities rest on the horticultural fraternity, and the public has a right to expect a high standard of attainment and a fully-developed sense of responsibility. Also, if you will recall the

words of the Minister of Agriculture, Mr. Roberts, in his opening address before the institute's conference last year, he stated that in New Zealand the total value of the horticultural crops produced was many times that of the agricultural.

Thus, not only aesthetically, but also economically, horticulture has a greater influence on the community than is generally appreciated.

We ourselves naturally consider our field of interests most important. We must realise, however, that a great deal of our knowledge is still empirical, and it is vital that everything should be done to ensure that information given is not only correct but is as complete as possible. Let us then briefly consider the various ways in which our knowledge of horticulture has been, and can be still further, improved.

EVOLUTION OF EDUCATION IN HORTICULTURE

Horticultural practice as it is known to-day is complicated, and displays many facets. From biblical and ancient times (even at that early stage plant introductions had begun) information about the cultivation of plants has been steadily accumulated. The Ancients and their gardens, beginning with the Greeks, were followed by similar gardening practices carried out by the Romans, and then by the monks and herbalists of the fifteenth to seventeenth centuries. But horticulture developed as a profession in the large estates of the eighteenth century. With the periods of exploration during the eighteenth and nineteenth centuries plants were continually reaching England from South Africa, Australia, New Zealand, the Orient, India, and America, and gradually their cultivation and the methods for their survival became specialised. Extensive introductions from the alpine chains of the world led to the cult of the rock garden with its particular requirements, and so another branch of specialisation was developed.

When the cultivation of ornamentals under glass became a major undertaking, horticulture as it is now known was definitely taking shape. The great output of books and the publishing of gardening papers during the early nineteenth century indicated the awakening interest in theoretical training and specialised knowledge.

In those early days recognition of the qualifications of an individual horticulturist was based principally on the standing and reputation of the estate on which he was employed. To some extent this still persists, and in this institute certain gardens are recognised as approved centres of training. With the development of public gardens additional training grounds became available, and present-day parks and reserves and botanic gardens are available to supplement the training of young workers.

One of the most significant steps taken was the establishment of recognised courses of training at certain centres. The Royal Botanic Gardens, Kew, was one of the earliest; other important centres followed. Here practical work and theoretical study were carried out by the young men employed. This training was available only after they had had a certain number of years' practical experience. At the successful completion of the course a certificate or some other recognition was granted to those reaching an approved standard.

The requirements and prescriptions of subjects for the New Zealand institute's certificates and diploma have been based on this type of training.

Another step forward was taken when emphasis was placed on the scientific approach to plant physiology, anatomy, protection, and classification and breeding.

Thus three stages of development in horticulture can be recognised: First the pure "art and craft" phase of the Ancients; secondly the supplementing of this with a small measure of scientific knowledge; and finally the present-day stage in which science and the results of research play a part no less important than the art and craft of the profession.

SKILL AND TRAINING

To-day horticulturists require, and horticultural education should provide, two main things:—

1. **Skill in the art and craft of plant cultivation.** Only by undergoing a thorough practical training under one versed in such methods, but who is alert to appreciate any contributions research workers may make, can proficiency be gained.
2. **Scientific Training,** which should provide the foundation for the practices which are followed.

Only by a judicious combination of these two phases is it possible to train men who will be masters of their calling and capable of discharging their full responsibilities.

In New Zealand, with the support of kindred bodies, the Institute of Horticulture became interested in the establishment of a national school of horticulture, but it was gradually recognised that such a school at one centre would not be capable of meeting the full requirements of the Dominion. The climate is too diverse to allow training at one centre to be generally applicable.

Though it may be outside the scope of this article, it is considered that the very fine assistance given in the past by members of this institute to young horticulturists can be further improved. By arranging for the exchange of their trainees employers could assist in raising the standard for the institute's examinations and widen the experience of the trainees. It is considered, however, that such exchange should take place only after the trainees have received their basic training in general horticultural principles—say, after the third year of their apprenticeship.

The object of horticultural education is to enlarge the vision and extend the technical training of the student, and thus equip him to meet the tasks associated with his field of endeavour. In this age of specialisation an advanced treatment of every special aspect is beyond the resources of any course of training and the capacity of any trainee. A broad general training is the first objective, and this should serve as the foundation on which the individual may erect his edifice of specialisation. It is recognised that the university-trained man and the practical man usually have two distinct fields of interest. Frequently the former is concerned mainly with research, while the latter is directly interested in the production of results of economic or aesthetic value. Any well-balanced course of training must recognise the claims of both, but not be unduly influenced by one to the detriment of the other.

We then arrive at the all-important question of how best to educate and train our future horticulturists. Nobody interested in this problem can advance very far without reference to the paper (No. 3) appearing in "Occasional Publications in Scientific Horticulture", Nos. 1-3 (1939-42), published by the Horticultural Education Association. This paper, entitled "Memorandum on the Reconstruction of Horticultural Education, and a Review and Criticism by the Committee of the H.E.A.", deals comprehensively with the subject under discussion. It has appeared at a most opportune time when we are all concerned with the future of our profession.

In New Zealand to-day the recognised professional standard is the Diploma of the Royal New Zealand Institute of Horticulture. This can be gained after six years of practical work, together with the ability and knowledge required to pass the examination.

RECOMMENDATIONS

The following suggestions are made for the furtherance of horticultural education in New Zealand:—

1. That all students who register with the institute should obtain by the end of their third year of training sufficient theoretical and practical training to enable them to undertake the cultivation of ordinary garden plants, whether flowers, vegetables or fruits. This would require the establishment of demonstration allotments in many of our parks, which would assist not only students but also the public. Thus the experience gained by the student would be widened, and incidentally the public might be induced to take a greater interest in horticulture.
2. That a list of approved gardens willing to receive exchange student-trainees from other centres should be compiled.
3. That a degree in horticulture should be established—either a B.Agr.Sc. (Hort.) or B.Sc. (Hort.), such as has already been established in England. Provision could be made for agricultural chemists, biologists, entomologists and pathologists to obtain a training in horticulture; the pure scientist could be trained in horticulture, or a horticulturist could be trained in science and research. Such degrees should produce good technical advisers and research workers, who would greatly assist horticultural progress in New Zealand.
4. That a correspondence course dealing with all branches of horticulture be established. Such a course would do much to assist students and others to avail themselves of the facilities in larger centres.

TARANAKI ACTIVITIES

FAVOURED by perfect weather, the Taranaki council spent a most enjoyable morning on Sunday, May 26, in the garden of Mr. Russell Matthews, at Tupare, Mangorei Road. There was an excellent attendance, and, though a high gale the previous week had blown leaves off some of the trees, the autumn tints were still well worth the visit. Another interesting feature was the progress of the development of water gardens down the main valley. The rhododendrons also came in for special attention, as a fortnight previously the council had had a visit from Dr. Yeates, of Massey College, who had chosen as his subject "Rhododendrons and Azaleas", illustrating his talk with fine colour slides of his own making. Other bodies interested in horticulture were invited, and there was an attendance of more than sixty.

The principle of making the visits of outside speakers of standing the occasion for open meetings seems one that will find general favour in New Plymouth, and a good programme seems assured for the winter. A course of ten lectures, under the auspices of the W.E.A., has been arranged, in addition to society meetings, the general topic being gardening in all its aspects. At the same time night classes in horticultural botany and plant protection are attracting an increasing number of students, not only those interested in working for the institute diploma examinations, but also rehabilitation students for the Seedsmen's Certificate and for pharmacy examinations.

CATALOGUE OF BOOKS

Through the good offices of Mr. A. L. Low, librarian of the New Plymouth Public Library, a special catalogue of books of horticultural interest has been prepared and reproduced in sufficient numbers to be made available to all members of the Taranaki council and societies interested. The list has been cyclostyled, and includes a synopsis of each work. As further accessions are received, a separate list will be circulated. This service should prove a great boon to those wishing to study special topics. In the spring it is hoped to hold a special horticultural book week, displaying not only books in the library, but also those in private possession that may be lent for the occasion.

LOWER HUTT'S EXAMPLE

Reserve Department's Task in Town Planning and Beautifying

By E. HUTT, N.D.H. (N.Z.)

Superintendent of Parks and Reserves, Lower Hutt.

[An address given in February, 1946, to the annual conference of Superintendents of Parks and Gardens.]

PRINCIPALLY because of shorter working hours and growing leisure time, coupled with more intensive working and living conditions, the provision of recreation facilities is becoming more important. Opportunities for wholesome recreation have become essential in every community.

THE recreational facilities of many cities and boroughs do not include sufficient park and play areas, and, furthermore, their distribution is poor. In the main these shortcomings are the result of failure by the municipal authorities to realise the need for recreation areas while the cities were small and before they became built up. As a result, the provision of adequate facilities in the congested areas of some cities is regarded as out of the question because of the prohibitive cost of acquiring land.

The city of Lower Hutt is unusual in that in a few years it has grown from a small borough with a population of a few thousand to a city of 32,000, and this will increase to 55,000 during the next five years. Fortunately its city fathers foresaw this rapid development, and, rather than develop in hit-or-miss fashion, they early appointed a town planning officer to plan and guide its development in accordance with a carefully-prepared long-term plan.

In this account the Reserves Department's relationship to the preparation and development of this city plan is briefly described.

PRELIMINARY SURVEY

The preparation of the city plan required the assembly of information and data about existing population, land utilisation, topography, traffic, public facilities and services of all sorts, as well as recreational facilities. Most of these data, when compiled, were mapped in considerable detail and revealed that the position, statistically at least, was fairly satisfactory for recreation facilities, though distribution was not ideal.

It was realised, however, that the position regarding recreation would deteriorate very rapidly with the expected increase in population unless adequate steps were taken to acquire additional land for reserves, both within and beyond the city boundaries. As it was recognised that the city must extend its boundaries into Hutt County, the county council agreed to the city authorities controlling development of such areas as were likely to come within the city.

SELECTING AREAS FOR RESERVES

The main objective in planning the city's reserves was an adequate well-balanced system composed of all types of areas, distributed in proper relation to the population and with regard to the configuration of the land. Land with irregular topography and low-lying areas subject to flooding, being undesirable for residential or commercial uses, were found suitable for parkland and picnic grounds. The provision of children's play areas and sportsgrounds was studied in regard to their adequacy for serving the estimated future population of each neighbourhood.

CHILDREN'S PLAY AREAS

Playgrounds intended for children up to junior high school age were regarded as an important link in the recreation facilities of the city. After consideration of all the facts, together with the knowledge gained from existing play areas, it was decided to make provision for a system of play areas whereby, as far as possible, every home in the city would be within a quarter-mile of a playground.

Long before the streets were planned, and after consultation with the town planner, the Superintendent of Reserves prepared a plan showing the approximate locations of the proposed play areas. This plan, necessarily fairly elastic, was submitted to and adopted by the Housing Department, who were the chief subdividers of the land. Every one of these playgrounds, with very little variation in their location, is in existence to-day, although some are as yet undeveloped.

Overseas it is common practice to provide children's playgrounds with an area of three to seven acres, but they are designed to serve neighbourhoods with a density of population up to 300 an acre. In Lower Hutt, where the density of population is less than 50 persons an acre, it has been found that areas of one to two acres make the most efficient playgrounds; only in one or two cases does the area of the new playgrounds exceed two acres.

The "interior block play area," popular in America and theoretically good, has not proved successful in Lower Hutt, and all new areas have been planned with a frontage making the whole of the playground visible from the street, which is not, of course, a major thoroughfare.

MAJOR SPORTSGROUNDS

As mentioned, the survey of existing facilities for adult recreation disclosed their number to be fairly satisfactory, but with poor distribution. Many discussions between the Town Planning Officer and the Superintendent of Reserves, and numerous visits to possible locations, took place before the town planner prepared a plan for a complete system of major sportsgrounds. This plan provided for three new grounds and the enlargement of an existing one, and was based on the town planner's information about the disposition of future population and the Reserves Department's intimate knowledge of the requirements of various sports.

As with children's play areas, the location of these sportsgrounds was planned before the street planning, and it is of interest to note that all of them exist to-day; one of the new grounds and the ground which was enlarged are at present being developed. The grounds were planned of such a shape that the maximum number of playing fields could be accommodated with a minimum of waste space.

Experience has shown that major sportsgrounds cannot be properly controlled without a resident caretaker, and in all cases a reservation has been made for the caretaker's residence.

SMALL OR "NEIGHBOURHOOD" PARKS

So-called "neighbourhood" parks are a most desirable part of a reserves system, and wherever possible areas for this purpose have been provided. These parks vary in size from four to nine acres, according to circumstances. Their design will necessarily be influenced by the shape and topography of the site. Generally, however, in addition to being landscaped they will include such features as children's play equipment, croquet lawns, or tennis courts.

An interesting type of reserve which could come under the heading of neighbourhood parks is the "strip reserve." This type of reserve, which has been successfully used in some housing schemes in England, was accepted with considerable modifications after a number of conferences between the town planner, the Reserves Department, and officers of the Housing Department. As now adopted, the houses will back on to the reserve, but there will be no direct access to the reserve from the houses. Whether this type of reserve will be really effective in this country only time will tell.

LARGE PARKS AND RESERVATIONS

Lower Hutt is singularly fortunate in its heritage of permanent open spaces. Several hundred acres of river flats within the stopbanks are subject to occasional flooding and can never be used for building. Some of this land is quite suitable for sportsgrounds, and already one such ground has been developed to provide active recreation for some 600 players each Saturday, in addition to being well used on week days.

After very full consideration by the town planner and the Reserves Department it has been planned to develop a further 40 acres of this land as sportsgrounds, and the remainder, together with the river beaches extending through the length of the city, will be developed on naturalistic lines and will be large enough to give a feeling of freedom and open country.

Gear Island, an area of more than 100 acres, is situated near the river mouth, and tentative plans for its development as a landscaped park with recreational facilities have been prepared by the Reserves Department.

Several acres of the hills to both the east and the west of the city have been acquired for parks purposes and are being devoted to native flora. Further areas will be acquired as opportunity permits, and ultimately the city will have its green belt of hills clothed in native flora.

CO-ORDINATION NECESSARY

Attempts to solve separate problems connected with town planning by independent action by Town Planning and Reserves Departments was found to be ineffective. Segregated efforts could not produce understanding of the interrelationship between problems, and the town planner in effect became a co-ordinator of all phases of town planning. A few examples of the affinity between the two departments may be quoted:—

Choice of Areas: The Reserves Department advises on the adaptability of areas for parks, sportsfields and other open spaces, and also on the quantitative requirements for various codes of sport.

Landscape Architecture: A function of the Reserves Department is to create beauty by producing harmonious landscape effects in accordance with the plan. By acting in an advisory capacity in the subdivision of land and the construction of streets, it also preserves beauty by guarding against the ruthless destruction of trees. In recent years there has been a very real desire to see natural beauty preserved where its destruction is avoidable.

Location of Public Buildings: Where the town hall, library, administration offices and cultural buildings are grouped to form a harmonious composition, commonly called a civic centre, the mere grouping does not alone create an attractive feature. The aesthetic contribution which these buildings can make to the appearance of the city is largely dependent on the Reserves Department's provision of an adequate landscaped setting.

Street Design: There is no doubt that well-designed streets with suitable and properly-maintained trees add much to the attractiveness of a city. Primarily streets are traffic ways, but they are also rights-of-way for such services as water, gas, drainage and electricity. Town planning requires the design of the completed street, including trees, to be adjusted to all of these uses, and this can obtain only when there is close co-operation between the town planner, the city engineer, and the Reserves Department. Services which conflict with tree planting, such as sewers, electricity and telephones, may often be accommodated in casements at the rear of sections. Another interesting development in street design is being carried out by the Housing Department. The department's landscape architect makes plans for, and has carried out under his direction, the planting of the front gardens of State houses. This planting, which is planned to harmonise with the Reserves Department's street trees, has most pleasing results.

Railways: This necessary service may be anything but attractive where the railway runs through a city without appropriate treatment. In Lower

Hutt one railway, flanked on both sides by a major thoroughfare, runs almost through the centre of the city for five miles. The first section, constructed some 20 years ago, was built with the track about six feet above the flanking roads. When the extension of this railway was recently contemplated, representations were made by the Reserves Department to have the track constructed at a level no higher than that of the flanking roads. After conferences between the town planner, the Railways Department and the Reserves Department, a plan was evolved which provided for the track at road level with the adjoining grass berms banked so that the railway runs through a miniature cutting. This will be suitably planted and the railway almost completely screened.

THE CITY PLAN IN PRACTICE

However perfect the theoretical scope of the plan, its scope in practice will be determined to a large extent by the capacity and the artistic conception of members of the Reserves Department. With the exception of its streets, nothing in the physical make-up of a city is quite so permanent as its reserves and open spaces, and the character of the city is largely determined by them.

The Reserves Department will be required to play an increasingly important part in the civic and social life of the community. The use to which increasing leisure is to be put by the people is of great importance to public welfare. If ill spent it will lead to a host of social problems; on the other hand, if devoted to wholesome physical recreation it will help the average person to live a more contented life, with improved physical and mental fitness. The town planner is principally concerned with the proper location and size of recreation areas, whereas the Reserves Department's function is to provide a variety of recreational facilities, properly equipped and well maintained, and in harmony with the requirements of the community. The use made of the facilities provided is perhaps the best indication of their suitability.

There has been a tendency to formulate mathematical standards, sometimes based on overseas practices, for the provision of reserves and open spaces in this country. Obviously any broad standard should be based on New Zealand conditions, and even then the variety of local conditions in this country would preclude the adoption of a general standard.

The provision of community centres is being considered in many districts, and here again their conception appears to be based on European standards. By all means let us have those centres, but have them suited to this country's way of life.

Town planning and city beautifying are not new to New Zealand. There is evidence in some of our cities to-day of the remarkable foresight of the pioneers. The heritage of magnificent trees handed down to the city of Christchurch by past generations should be an inspiration to all to make similar provision for future generations. An attractive city cannot be produced overnight; it is the result of consistent and energetic effort over a period of years.

NEW VARIETY OF EARLY MAIN-CROP POTATO

NEWS has been received of a new variety of early main-crop potato raised by Mr. J. Harper, of Rathillet, Fife, Scotland, and named "Dr. McIntosh". It is the result of a cross between a South American species of the potato family and the variety "Herald", and is immune from wart disease. It is said to be a good cooker, keeps well, and is the heaviest yielding potato ever tried at the national trials at Sutton Bonington, in Leicestershire, England, where it yielded at the rate of 18 tons to the acre. Stocks of the new variety are now being built up, and no doubt much more will be heard of it.

THE FLOWER-GROWING INDUSTRY IN HOLLAND

When Mrs. van Panhuys, wife of the Consul-General for the Netherlands in New Zealand, opened the Miramar and Eastern Suburbs Horticultural Societies' 1946 dahlia show in Wellington, she said the flowers and gardens of New Zealand were helping her compatriots, now recuperating here in Kolonie Miramar, to forget their years of great hardship while interned in Japanese hands. She then went on to describe the flower-growing industry in her own country.

"BEFORE the war flowers in Holland had reached such a state of perfection that Dutch growers were competing on practically all foreign markets," said Mrs. van Panhuys. "Flowers were sent by steamer, by rail and by air to all parts of the world. Not only tulips but roses, gladioli and orchids were sent in cold storage to New York and sold in the florists' shops there.

"It was all a matter of combining science with practical methods. Dutch growers had the technical knowledge, the equipment, and the experience. What a delight there was in store for anyone who cared to inspect the hothouses at Aalsmeer, the centre of the flower-growing industry, south of Amsterdam! The enthusiast would find there all the flowers that a fashionable market could demand—the fragrant roses and carnations as well as the glorious and exotic orchids. By their excellent methods and systematic organisation, Dutch growers were able to compete with the famous flower-growing centre of the south of France.

"Hothouses are needed for this industry in view of Holland's cold climate, though the bulb-growing industry is mostly carried on out of doors. Many will have seen coloured photographs of the tulip and hyacinth fields; they are generally at their best about the beginning of May, but the height of their glory does not last longer than about two weeks. This industry is confined to a small stretch of land south of Haarlem, along the seacoast behind the dunes—an area of not more than two miles by 18 miles. Bulbs are also grown elsewhere in Holland, but in much smaller areas. Commercial bulb-growers tried to grow Dutch bulbs abroad—in France at le Bourget, north of Paris, and in North Carolina in America—but they have never attained such perfection as has been reached on that particular small stretch of land, where the soil is a mixture of peat, clay and dry sand from the dunes.

POST-WAR HANDICAPS

"What the future of the Dutch flower industry will be is a matter of conjecture," said Mrs. van Panhuys. "The bulb industry has already resumed its exports, principally to the U.S.A., England, and Sweden. Last October bulbs and plants totalling almost one million pounds were exported, mainly to England and America, representing some 43 per cent. of the value of Holland's exports for that month. Supplies of Dutch bulbs are limited, partly because of the reduction in horticultural acreage which the Germans imposed on the growers, partly because millions of bulbs had to be used as food last winter.

"About 17 per cent. of Holland's agricultural land is now unfit for cultivation, mostly because of flooding with salt water, and it will be several years before this land can be reclaimed. During the reclamation the land is covered with gypsum and then sown with temporary grasses, clover and lucerne. This work is, unfortunately, greatly handicapped by lack of tools and machinery. In Holland the value of land for horticulture is up to twenty times as great as for agricultural land.

"The soil is the greatest source of Holland's income, and in normal times its products had a value of some £250,000,000, about half of which was exported.

On the other hand, £80,000,000 was spent in importing seeds, grains and fertilisers. Now much has been changed by the war, and many countries will not be able to permit themselves the luxury of any flowers but those grown in their own gardens.

"In Holland, apart from a highly-developed flower industry, the average Dutch citizen has a little garden and cultivates his own flowers like so many people in New Zealand. Most Dutch housewives have so far been fortunate enough to have help of some sort in the house, so that they could devote some of their time to the garden and flowers. Nature has been generous in making much of the soil most fertile and the rainfall is well divided, so that droughts are not as common as in New Zealand.

"When all is said and done, the Dutch are a very homely people and in a good home flowers are indispensable, as you so well realise in this country," concluded Mrs. van Panhuys. "To cultivate flowers is to cultivate the spirit of beauty, which we cannot encourage enough."

IRIS TINGITANA FORCED TO FLOWER EARLY

MANY attempts have been made in New Zealand to make Iris tingitana flower more freely, but with little success. A note was recently received from Holland to the effect that I. tingitana bulbs grown in the south of France are forced into early flowering in Holland by the following treatment:

Bulbs are lifted as early as possible, and sent to Holland, where they are stored for about three weeks at 28 degrees C., then planted in boxes of sand and subjected to the low temperature of 5 degrees C. until about an inch of foliage is showing above ground. They are then taken into a glass-house and kept at 13 degrees until the shoot is two inches long, and finally kept at 17 degrees C. until they flower.

Though this treatment is designed to **hasten** flowering, it would be interesting to find out whether it would **increase** the proportion of flowers produced under New Zealand conditions.

MOUNT VESUVIUS: This photograph was taken on the outskirts of Pompeii where, with 15 to 20 feet of volcanic pumice, pines do not grow to tall trees.

[F. Sydenham photo.

Taranaki Members See Damage Caused by Goats on Mt. Egmont

WITH the principal object of inspecting at first hand some areas damaged by goats, a party of members of the Taranaki district council of the institute spent a day on Mt. Egmont on Saturday, March 9. The day was particularly fine, sunny and almost without wind, and the bus that had been chartered was, to say the least, well packed. During a halt on the road the party obtained some idea of the many denuded areas both on Mt. Egmont and on the neighbouring Pouakai Ranges.

At the gates the party was met by the ranger, Mr. G. G. Atkinson, who had generously given up his time to act as guide and to explain his difficulties in coping with the goat menace. After morning tea at the North Egmont Hut the more energetic members set out across the Waiwaikaiho Gorge to examine three large areas of scree, all the result of the destruction of the covering forest along a ridge. The remainder of the party set off in groups along tracks about the hostel. The time of the year proved favourable, with many of the herbs and shrubs in flower, among them **Veronicas, Wahlenbergias, Ourisias, Euphrasias, Pratias** and **Leucogenes.**

PLAN FOR DESTROYING GOATS

When the party met again for lunch, Mr. Atkinson gave an outline of the campaign which, in his opinion, would be the minimum necessary for successful goat extermination. This he based on the provision of at least six experienced hunters, well armed, and with adequate shelter at higher levels to economise in travelling time. Ammunition was mentioned as a problem, as it was being charged for at full rates, with no reduction as in the case of rifle clubs. With this organisation, he considered, it would be possible to clear the mountain, valley by valley, driving the goats to the open at the higher levels, where they were more easily dealt with.

In proposing a vote of thanks to Mr. Atkinson, the president, Mr. L. W. Delph, assured him of the active support of the council in giving the question the fullest publicity. A resolution was adopted asking the executive council to follow up the remit passed at Timaru urging the Government to treat the subject as one of national importance, especially in Taranaki, where cumulative erosion would threaten the fertility of one of the principal farming districts of the Dominion.

The party included Mr. T. French, of Bell Block, a foundation member of the Taranaki council, who recalled his experiences of the mountain as long as sixty years ago, before the present roads were made and when the approach was made by way of the ranges. His impression was that much of the forest had changed, with many of the giant ratas falling as the undergrowth was opened up. He recalled, too, when the forest stretched down almost to the outskirts of New Plymouth, with occasional clearings along the bush tracks.

MANY NEW SLIPS APPEARING

As a result of the excursion, good publicity was given to the subject in the local press. Already many new slips are appearing, especially on the ranges, and as they are easily visible from New Plymouth it is hoped that public concern may eventually become greater and more support may be given to the park board in its efforts. From a botanical standpoint, irreparable damage has already been done in many areas. A study is to be made of regeneration after the goats have been destroyed. It is hoped to make a careful survey, the results of which will be published in this journal.

History of Parks and Reserves in Timaru

INTERESTING ORIGIN OF CAROLINE BAY

By A. W. ANDERSON, N.D.H. (N.Z.).

THE date when people first lived in Timaru is not recorded, but it is known that when whalers arrived about 1836 they found a number of old Maori huts on the foreshore at what is now known as Caroline Bay. The name Timaru is believed to have been derived from the Maori words "ti", the cabbage tree, and "maru", a shelter, and there is an old tradition that this was one of the stopping places used by the Maori travelling up and down the coast between the big settlements at Moeraki and Banks Peninsula.

THOSE early whalers had two camps, one at Whale Creek and the other near Patiti Point, just south of the Caledonian Grounds. Whale Creek has long since disappeared, but it used to flow into Caroline Bay near the present railway viaduct; the whalebones, harpoons, and one of the original trypots now standing at the entrance to the bay must be very near the site of the Whale Creek camp. Most of the whales in nearby waters seem to have been killed out within a few years, and in 1839 the two camps were abandoned. Ten or twelve years were to pass before white men again lived in the district.

When sheep runs began to be taken up the Provincial Government recognised the necessity for a town and port for South Canterbury, and, as a matter of course, the sites of the old whalers' camps came in for early consideration. It seems that the Patiti Point camp was considered the more important, as it was believed that the nearby reef would provide some shelter for a harbour, and when a township reserve was gazetted in 1851 it was near the site of that camp. The area was surveyed some five years later and the town laid out on up-to-date lines in quarter-acre sections. Many of the streets were named after members of the Royal family and a fair proportion of the land was reserved for public use. The northern boundary was North Street, and a main street, two chains wide and later known as the Boulevard, was laid out from there to the sea. A market place was set aside but rarely used, and is now known as Alexandra Square.

The main recreation area was reserved along the main street and in later years was merged with the old Gaol Reserve and came to be known as Anzac Square. Russell Square was mostly a lagoon, and in the true Victorian style the surveyor solved the problem of what was to be done with the useless area by leaving it for use as a recreation area. The wide Boulevard was leased for a rental of £10 a year for many years, and finally Mr. James Craigie, who became mayor in 1902, let a contract to plant it in trees at his own expense. It was later dedicated Craigie Avenue, and was finally levelled and kerbed during the slump years of the 1930's.

LAND TAKEN FOR RESERVE

The original surveyor left the district before he had completed the survey of the township and a considerable area was left unsurveyed. There was so little demand for sections in that part of the town that the land remained unconsidered until 1864, when the following notice appeared in the New Zealand Gazette:—

> "His Honour the Superintendent directs that it be notified that the following reserves made by him, temporarily, under the 9th clause of the Waste Lands Regulations, have been confirmed by the Provincial Council as amended:

"No. 344 in red—Fifty-six acres, more or less, situate in the town of Timaru; bounded on the northward by Queen Street; on the eastward by High Street; on the southward by the Boulevard, two chains wide; on the westward by the extension of King Street—for a public park, etc."

This reserve was placed under the control of the Timaru Park Commissioners in 1869, but there is little evidence of their activities in the records written in the flourishing longhand of the period. Johannes Andersen, in his "History of South Canterbury," refers to a report of 1875 stating that £923 had been spent on the area, but from the scanty evidence available it seems likely that he has confused the records with those of the Timaru Domain Board, which controlled the Caledonian Grounds. There is no doubt that about this time the belt of pine trees that used to encircle the park was planted by prison labour. Most of these trees have been removed, but several groups of them still form a picturesque southern boundary, and there is one noble specimen near the Gloucester Gates.

DOMAIN BOARDS MERGED

When the Public Domains Act of 1881 came into being for the purpose of covering all such reserves a Timaru Park Domain Board was set up, and the borough council seems to have acted as this board. In 1895 the council suggested to the Department of Internal Affairs that, instead of having two domain boards, which were in fact the council, controlling this and the Otipua Domain —which is now the airport—they should be merged under one control. As a result the areas were vested in the Mayor, Councillors, and Burgesses of the Borough of Timaru as from January 1, 1896, and £160 was spent on it that financial year, including a ranger's salary of £125.

Alongside this reserve No. 344 was a smaller area that had been set aside in 1863 as a site for the Provincial Government Buildings. This was in the north-west corner, at the junction of King and Queen Streets, and consisted of five acres running down to the creek at the bottom of the hill. In 1881 the purpose of this reserve was officially changed, though it seems always to have been regarded as part of the larger area which was dedicated as a public park in 1863.

When the Timaru Public Parks and Gardens and Otipua Domain Board was vested in the council in 1896 there was already a ranger's cottage there. For many years the recreation area was somewhat neglected, and for about 30 years, until about 1910, much of the parkland was let for farming. The five-acre block seems to have been more or less developed and a ranger's cottage built there. Later a public garden was developed and a glasshouse built, which explains why there are so few old trees and why they came to be planted in the north-west corner, though the gardens area has been a recreation reserve since the very beginnings of Timaru.

HOSPITAL SITE ON DOMAIN

In the meantime history was being made in the north-east corner of the Domain. For a number of years before 1868 there had been considerable dissatisfaction with the position of the public hospital, and during that year the site for a new one was decided upon by the simple process of taking about four acres of the land that had been reserved for a public park.

The following is the text of an unsigned note from the Secretary of Public Works, dated October 21, 1868:—

"The site recommended is part of the reserve for a public park for which a Crown grant has not yet been received. Inform the Timaru and Gladstone Board of Works that, as there may be a legal difficulty in building the hospital on that site, I must delay the decision until I obtain the Provincial Government's opinion."

Permission to build seems to have been granted soon afterward, because meetings were held to supplement "the grant by the Provincial Council for

the erection of a hospital in Timaru, so that the building may be of stone instead of wood." It is of interest to note that though the erection of "substantial buildings" was started in December, 1868, not until 1938 was the position cleared up. Only then was the land cancelled as part of a public park and vested in the South Canterbury Hospital Board as a hospital site. During recent years the board has endeavoured to get a further small area for extensions, but so far with little result.

Soon after the land was vested in the borough a certain amount of development began to take place and with the new century things were speeded up. About 1906 arrangements were made for laying out a sports area and recreation ground consisting of bowls, tennis and cricket grounds. As the years passed additional developments took place, the leasing of areas for farming ceased, a band rotunda was built to commemorate the coronation of King George V, the native garden was laid out a few years afterward, and in 1924 the first show house was built. With the slump of the 1930's plenty of labour became available and the gardens were brought up to date, the rose garden and herbaceous borders were laid out, the cactus house and fernery were built, and a nursery was formed. In January, 1935, the main entrance was moved about 50 yards eastward from the original position, which was very dangerous for motor traffic, and the new gates were opened by the Duke of Gloucester.

DEVELOPMENT OF CAROLINE BAY

Caroline Bay is undoubtedly the main attraction to Timaru and many visitors are astonished to hear that that great area of lawns, shrubberies and sands has appeared and taken shape within the memory of many people on the sunny side of 60.

When the first whalers arrived a little more than 100 years ago there was a substantial shingle beach all along the foreshore, to all intents and purposes continuous with the 90-mile beach. The construction of the first breakwater changed all that. A strong ocean current running up the coast soon washed away the shingle, and within a few years the clay cliffs were quite unprotected and fell into the sea. So serious did the position become that the railway was endangered and extensive protective works became necessary.

The result was that for many years there was no beach to speak of at Caroline Bay, and the first attempt to provide bathing facilities was made by a private company which built baths near the present entrance to the parking ground at the south end of the bay, at a cost of £200. The remains of these baths finally disappeared with the extensions that took place in 1938-1940. As the harbour developments took shape sand began to appear, and in 1891 the first official reference to it was made. Within three years it had taken the three-fathom line 700 feet to seaward, but despite this it was a precious commodity and bylaws prohibited its removal.

When it was seen that a sandy beach was likely to appear the townspeople were not long in rising to the occasion. The mayor, Mr. Grandi, made a personal canvass of the town and raised £50 for bay improvements. On Arbour Day, 1894, a great tree-planting picnic was organised and the children were supplied with "unlimited buns and tea." The first trees had been planted many years before by Mr. W. Rutherford in the days before the sand began to accumulate, and many of them still stand by the overhead bridge behind the bay tearooms. They were planted to hide the rubbish and night-soil chute, which at that time ran into deep water.

At a public meeting held in 1897 to discuss the celebrating of Queen Victoria's diamond jubilee the first recorded discussion took place on the advisability of cutting down the clay cliffs, levelling the spoil, and generally improving the appearance of Caroline Bay. The project was reluctantly abandoned because the cost of a seawall would have been prohibitive. Some weeks later, however, the harbour board was able to supply sufficient discarded timber for the purpose and the work went ahead. Every Thursday afternoon for months afterward volunteers took their picks and shovels down to the bay

and the ladies of the town encouraged their efforts by providing afternoon tea. By the time "Working Bee Terrace" was completed it was found that the sand was being deposited in such quantity as to make the protective wall unnecessary, and the material was used for making seats and steps.

In 1903 the harbour board gave the borough council the tenure of 94 acres at a peppercorn rental. This area included not only the sands then in sight but those under the sea in a line from the old mole to the Waimataitai Lagoon. As a result of this agreement the upkeep of Caroline Bay became a public responsibility, a total of £3,200 being spent on improvements at that time. Tearooms were built in 1905 and in the spring of the year the clergymen of the town "respectfully but firmly protested against the opening of the tea-rooms on Sundays." It became a matter of solemn debate during the greater part of the summer and it was finally agreed, on a very small margin of votes, that the request be acceded to.

In 1911 the Caroline Bay Association came into being for the express purpose of improving the bay. This association is responsible for the carnival which has been run successfully for many years, with the result that many thousands of pounds have been handed over to the borough council for this work.

One of the greatest contributions the association made to the appearance of the bay was in building the memorial wall between the lawns and the sand. For many years this gave the bay a very neat and tidy appearance, but the sand kept accumulating and extensions on the seaward side of the wall became necessary in the years immediately preceding the war.

ASHBURY PARK

The Government town was laid out south of North Street because it was believed that the best landing place was near Patiti Point. It was not long before it was found that a mistake had been made and that the best landing place was somewhere near the present railway station. As a result the town developed very haphazardly, the fine "Boulevard, two chains wide," was deserted and a bullock track, later known as Stafford Street, became the main shopping centre. The result was that the new town had no recreation areas, and in 1910 the council bought 15 acres at the north end of the town for £84. This came to be known as North End Park. The land was leased until about 1922, when an additional area was acquired and plans were considered for laying out a playing area there. This new area had belonged to Lieutenant B. Woolcombe, who had been appointed Resident Magistrate of Timaru in 1857, and included the site of his old home that had been named Ashbury after the place of that name in Kent. The old drive has been preserved, as has an ash tree that was sent from England in 1861 and planted by Lieutenant Woolcombe in his garden. This is believed to have been the first "English tree" in South Canterbury. The name of the reserve was changed to Ashbury Park and additional areas have been added from time to time until its area is now 34 acres. During the 1930's the development of this park was reserved as a job for returned soldiers and all the levelling, formation of football grounds, and laying of the cinder track was done by them.

WEST END PARK

About 1919 the council bought 10 acres of what had at one time been the showgrounds. This reserve became known as Oldway Park, but within 10 years the area had been increased to 17 acres and the name changed to West End Park. It was leased for farming for a number of years and development work began in 1925. During the depression years a football ground and six croquet courts were formed in this reserve.

CENTENNIAL PARK

Originally the harbour board quarry, a total of 115 acres was acquired by the council in 1936 for £100. Mr George Bowker was not satisfied with the entrance and gave an additional 16 acres to provide an entrance from Otipua Road opposite Church Street. A road was formed through the reserve

with a total length of two and a quarter miles and trees were planted so that by 1940 it was ready to be dedicated as Centennial Park. With the completion of the harbour works an additional 34 acres of back facing was handed over by the harbour board and has been planted in pines.

CALEDONIAN GROUND

The latest addition to the city's reserves has been the Caledonian Ground, an area of eight acres comprising a sportsground, grandstand, and other facilities. This is Crown land, and in 1945 the Timaru Borough Council was gazetted as the domain board to control it.

THE DOMAIN BOARDS

The old records are all written in longhand and are not indexed, so it is very difficult to obtain much information about the domain boards which controlled the areas. It is often difficult to decide whether a reference to "the Timaru Domain Board" deals with the board that controlled the Caledonian Ground, the board that controlled Reserve 344 (the Park and Gardens Domain as it was sometimes called), or the board that controlled the area that is now the airport.

The following information was supplied by Mr. H. H. Fraser, who was secretary of the Timaru Domains Board (controlling the Caledonian Ground) for more than 30 years.

This body evidently originated in an Order in Council of October 16, 1885, because at a meeting held in December of that year the board compared this Order in Council with the Public Domains Act of 1881 and applied to have its powers extended. The Caledonian sports were held on these grounds for the first time on January 1 and 2, 1886, by the South Canterbury Caledonian Society, and one of the conditions governing the use of the grounds was that the society should spend £600 on them before January 1, 1888. In January, 1887, the secretary of the Timaru Domain Board was able to show the board that the Caledonian Society had in fact spent £731 during the past year on the improvement of the grounds. This happy arrangement was carried out with complete satisfaction to both parties until the domain board lapsed and the administration of the ground was taken over by the borough in 1944.

PRESENT AREA

The area of parks, reserves, playgrounds and endowment lands under the control of the Reserves Department is approximately 2,392 acres. In common with most Reserves Departments throughout the country, Timaru saw great development of reserves and parklands during the depression years. This reached a peak during the financial year ending March 31, 1940, when £13,117 (including interest and sinking fund) was spent from the rates and £26,202 from Government and other subsidies. The total expenditure for the year ended March 31, 1945, was £13,679 from the rates and, as has been the case in many other communities, this has not been sufficient to maintain all the development work done during the years immediately preceding the war.

The Ultimate in Labour Saving

A new garden tool now on the market will cut down the labour of heavy digging by half. Gardeners are advised to get two of them.

—Extract from "Punch", 1946.

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