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No. 2

NEW ZEALAND SHELTER TREES AND SHRUBS.

BY B. C. ASTON, F.N.Z. INST.

It has always been the writer's opinion that for shelter belts, quick hedges, and individual trees for the small garden, where protection from sun and wind are necessary in growing choice garden plants, the smaller New Zealand trees and shrubs are superior, on the whole, to the imported species found useful for such purposes in other countries. In this opinion no less an authority than the Rev. J. H. Simmonds ("Wind Breaks for Fruit Farms," New Zealand Journal of Agriculture, Vol. 15, 1917, p. 259) has already made a pronouncement which is the more valuable as he writes from experience in the Auckland district, whereas the writer's experience is derived from Dunedin and Wellington districts. On indigenous shrubs he writes as follows:—

"In our New Zealand flora we have a great wealth of evergreen shrubs that reach heights of 10ft. to 30ft. or 40ft., but never become large forest trees. Some of these plants are extremely hardy and will grow in the most exposed situations. Others are shade-bearers, and will thrive around the stems of bigger and taller trees. Many of them will bear severe pruning, and will sprout and grow again even if cut down to the ground. A few are restricted to warm areas in the North, but there are others that can endure lowland frosts as far south as Stewart Island. This rich sub-forest indigenous flora is at our doors; but for some reason, or lack of reason, no serious endeavour seems yet to have been made to find in it the solution of our orchard wind-break problem. For forests and big shelter belts the exotic conifers and the eucalypts are incomparably better than our slow-growing native timber-yielders; but for low shrubbery, such as is appropriate in close contiguity to an orchard or garden, what could possibly be better than our beautiful sub-forest evergreen shrubs?"

A. W. Green, who had considerable experience in growing nursery plants of all kinds, writes (New Zealand Journal of Agriculture, Vol. 4, 1912, p. 444):—

"A factor of this indigenous plant life is that an exceptionally high proportion is of a shrubby nature, and therefore lends itself admirably to the formation of hedges. Unfortunately, up to the present this fact has not been realised. There is every probability however, that some now almost unknown native plants will in time become favourites for this purpose."

Matthews ("Tree Culture in New Zealand," 1905, p. 55) gives a list of many New Zealand plants, which are suitable for hedges, with directions for growing, and further on, pp. 59 and 67, those suitable for seaside planting. He gives a wealth of detail, which the writer will endeavour to incorporate in the notes on the individual species. Matthews was evidently impressed with the use which could be made with the smaller growing trees and shrubs for shelter purposes. A valuable report by Sir Truby King, giving the results of his investigations at Karitane, on the coast north of Dunedin, is given by Matthews.

The writer's experience is mainly derived from a small garden situated in a gully of the Karori hills some 600 feet above the sea; a locality which is practically frost-free, the air being nearly always in movement, a condition which is antagonistic to frost. It is necessary to mention this, as temperature is a limiting factor in the growth of many desirable North Island plants, and what will grow here in a wind-screened site, which is also frost-free, will not grow lower down the valley where the frost lies. Shelter belts, or high hedges, are necessary here to screen off the keen, steady southerly gales, the gusty north and north-western winds so liable to break off branches, and to act as a buffer to the back draughts rebounding from the north side of the house which seem to be as injurious as any direct blow.

It was a dictum of Hutchins, the famous forester, who spent some years in New Zealand, that it was an advantage to grow the indigenous plants because they were less susceptible to the attacks of insect pests, blights, fungi, etc., to which exotic plants might fall a ready prey. Certainly the exotic hedge plants do seem to be attacked by all sorts of enemies and to become fertile breeding grounds for one of the most dreaded plant plagues which affect fruit trees, e.g., fire-blight on the hawthorn.

One has only to run the eye over a list of hedge or shelter plants commonly used, in order to note the advantage which New Zealand trees have over exotics; for instance, the pines and cypresses, quick growers but occupying much soil and drying up the ground and therefore less suitable for small areas; the hawthorn, which usually has a miserable appearance owing to the vigorous attacks of the leaf-eaters in summer, and a thorny appearance in winter. This and other plants armed with thorns and spikes require considerable exertion to trim from time to time to the form of hedges, exertion which is accompanied by some danger in attacking such plants as the African box thorn, barberry, gorse, etc., capable of giving poisonous wounds, and only to be

tolerated where stock must be kept out. Another group of plants grows so fast that the labour of keeping them in shape becomes irksome. Such are elaeagnus, privets, etc. Then there are some which are too slow-growing, such as holly, box and yew; some that are too tall, such as Lombardy poplar; and others that are too dense, such as laurel, viburnum, etc. But the worst are eucalypts, which are robbers of soil moisture, and are very tall in growth. In short there is something objectionable about most of the exotics capable of being grown easily about Wellington. One must, however, confess a great admiration for such glorious exotic hedge plants as produce a profusion of scarlet or blue flowers. Tecoma is one of these desirable kinds.

Most New Zealand trees and shrubs require little trimming and cutting, but, left to themselves, assume a rounded form which is quite attractive and effective as a wind-break. They have the merit that they are beloved by the native birds, such as the wax-eye and the grey warbler, which frequent them constantly in search of insects or berries or shelter. For a general purpose plant, which may be either grown into a thick hedge or a rounded tree according to the requirement or taste, the ngaio (*Myoporum laetum*) for Wellington conditions is first choice, for it stands any wind and has a pleasing open habit grown as a shelter belt, and if trees become too leggy may be pollarded and soon produce an abundance of pleasing growth. However, at Karitane, in Otago, apparently, it is of doubtful value, owing to being cut by the frost, but Matthews commends it for seaside planting. The rarer form of ngaio, from the Poor Knights, with very large leaves and containing few oil glands, is of slower growth in Wellington, but may prove useful. One drawback to the ngaio is that it is poisonous to cattle, which in winter are often driven by hunger to eat the leaves.

Another tree which may be used as a shelter hedge or grown as shelter belts is the karaka (*Corynocarpus laevigata*). This is almost as hardy as the ngaio, loves a windy situation, and grows naturally on stony talus slopes which support no other growth. It has a dense, compact habit of growth, and produces, in season, an abundance of edible orange-coloured drupes with poisonous seed. The foliage is of great beauty and is useful for cattle food in times of scarcity. It is hard to imagine a more suitable all-round small tree. Both the ngaio and the karaka may be easily raised from seed, but the karaka is much slower in growth than the ngaio. The variety of karaka with the very large drupes and leaves is the one which should be grown. It is evidently unsuitable for the Otago coastal conditions, where it is much cut by frost. The broadleaf (*Griselinia littoralis*) is an excellent hedge or shelter plant, easily propagated from cuttings or from seed, and does not grow too fast. At Karitane, Truby King states that on account of its hardiness and permanence it is one of the most desirable seaside shrubs, and on fairly good soil is not so slow growing as generally supposed. It can be relied on for ultimate shelter and continuous steady growth. He recommends it as a good pioneer to plant on the windy

side of any shrubs of doubtful permanence, such as some of the senecios and olearias. At Belmont, Lower Hutt, it forms useful hedges. Matthews states, p. 54, that there are few native trees more suitable for a hedge plant than the broadleaf, and few more easily raised from seeds or cuttings. According to the writer's experience this latter method would seem to be the best and quickest under Wellington conditions.

Many of the small trees and shrubs belonging to the genus *Pittosporum* are highly decorative, hardy, quick growing, do not require cutting or trimming, and are easily raised from seeds. Among other more treasured shrubs some species of *Pittosporum* may be planted to give protection, and when this is no longer needed the shrubs may be cut out, abundance of the seedlings usually being at hand under the old shrubs to supply fresh stocks. In this genus very small plants are more easily transplanted and make quicker growth than older stock. Indeed, Matthews advises planting the seed where it is intended the plants shall ultimately remain, as by this method a better and quicker growth is made than if sown in nurseries and afterwards transplanted. The form of *Pittosporum Colensoi* from the North Island volcanoes has all the good qualities of the genus, hardiness and quickness in growth, with highly attractive foliage, quite flat leaves and a cherry-like polished bark. It is a common plant on Tongariro Mountain, where it has to withstand a high degree of cold. It bears cutting well, and is quite distinctive in appearance from any other nearly allied species or the South Island form which bears the same name. *P. tenuifolium* (black matipou) provides a number of forms with handsome foliage. *P. eugeniioides* (tarata or lemon wood) is of slower growth, but has yellow flowers and the most beautiful foliage of any of the genus. *P. umbellatum* is a northern species which is worth growing. *P. crassifolium* is another northern form useful as a hedge plant, but not quite happy in Wellington, where it is attacked by various pests. It has large red flowers with very large fruits. The Hawkes Bay *P. Ralpii* is an attractive tree which Sir Truby King considers the best for the Otago coast. *P. cornifolium*, usually found growing as a small bush high up among the *astelia* clumps in some forest trees, takes quite kindly to a ground habitat, and as the limit of its height growth is only a few feet it is a useful subject for the rock garden. When in fruit it is highly attractive, the expanded capsules showing three colours, bright scarlet valves, canary yellow resin and black seed. Mature specimens can often be obtained from some fallen tree, and transplant quite easily. Some species of *Pittosporum* are of such slow growth and of such an extraordinary habit that they are more curious than beautiful—merely a mass of interlaced branches such as those of *P. rigidum*, *P. divaricatum* and a few other rare species. These might find some use on the rock garden where bizarre plants are not altogether out of place.

Matthews recommends generally *Pittosporum Buchananii*, which grows from Dunedin to the Bluff naturally, *P. Colensoi*, southern form, *P. crassifolium*, *P. eugeniioides*, *P. fasciculatum*, *P. Ralpii* and



Nikau growing in Nature, Westland.



Pukapuka (*Meryta Sinclairii*) and *Senecio Hectori* growing in the author's garden, Karori, protected by karaka.

P. tenuifolium. Green follows Matthews in recommending the same species, and considers *P. crassifolium* (karo) the hardiest and *P. eugenioides* the most delicate. Green's experience was, however, derived from the Waikato district, where *P. crassifolium* would be more at home, it not being found south of Poverty Bay. The writer has found *P. eugenioides* quite hardy on the Dunedin coast and also in Wellington sub-alpine situations.

There are a number of shrubs and small trees of divaricating growth presenting a close resemblance to one another although belonging to many different families. The possibilities of some of these for quick hedges have not been experimented with to anything like the extent they deserve. One instance reported to the writer which has been successful, is that of *Corokia Cotoneaster*, which is said to be used successfully as a hedge plant on the East Coast of Wellington district. This plant is well spoken of in England as an ornamental shrub, having beautiful, small, starry, yellow flowers, succeeded by yellow fruits. Amongst other species of plants with this rigid interlaced habit, which the writer is experimenting with, are the following:—*Hymenanthera crassifolia*, *H. dentata*, *H. obovata*, *Pennantia corymbosa* (kaikomako or bridal tree), *Discaria toumatou* (N.Z. buck thorn), *Carmichaelia* sp. (leafless broom), *Sophora prostrata* (kowhai), *Rubus cissoides* (leafless bramble). *Carpodetus* (puta-putaweta), *Myrtus obcordata*, *M. pedunculata*, *Coprosma* sp. (karamu), *Olearia coriacea*, *O. nummularifolia*, *O. fragrantissima*, *O. virgata*, *O. Solandri*, *Melicope simplex*, *Nothopanax anomalum*, *Paratrophis microphylla*, *Helichrysum glomeratum*, *Leucopogon fasciculatus*, *Suttonia divaricata*, *Rhabdothamnus Solandri*, *Muehlenbeckia* sp., *Paratrophis*, *Nothofagus Solandri* (beech), *Podocarpus spicatus*, and *Melicytus micranthus*. Some of these are not rigid, but so resilient that they act as well as a rigid fence.

A charming genus of mainly shrubby plants is coprosma, of which there are about forty described species. For hedges, the well known *C. Baueri* (taupata) is the most suitable for Wellington coastal districts. Laing and Blackwell, "Plants of New Zealand," 1906, p. 392, state that it is much used in Melbourne for hedges. This species stands salt spray well, and may be produced from cuttings or from the abundant seed. It stands trimming well, and forms a very thick quick hedge when properly treated. The attractive red fruits produced are much sought after by birds. The glossy, green, tumid leaves have also an attractive appearance. Other large species are *C. lucida* (karamu), *C. robusta* and *C. grandifolia* (kanono). These are all fine, very hardy plants, producing great crops of coral red berries, especially the first two. They are excellent plants for the shrubbery. The kanono is the best dye plant in New Zealand, the bark being a wool dye similar to madder. It is the predominant constituent of the scrub on the Eastbourne hills, about 1,000 feet above the sea, where clearings have been made in the forest. Many smaller species are delightful when in fruit owing to the different colours displayed. *Coprosma brunnea* and *C.*

acerosa having light blue fruits. At Karitane, Otago, *C. Baueri* is cut by the frost where *C. lucida* is thoroughly hardy and reliable. Matthews, while commending the taupata generally, says it is not suitable for southern or inland portions of the Dominion on account of susceptibility to frost. A large number of the smaller leaved species have the divaricating habit of growth, the possible value of which is referred to above.

A type of hedge plant and shelter tree which must be considered, and one growing in importance, is that possessing an unusual kind of growth habit. These are eminently suitable for New Zealand or countries with a similar climate. *Phormium tenax* and *P. Colensoi*, two species of New Zealand flax, are excellent for hedges in windy localities. They will stand any hardship in the shape of poor soil, dry soil or wind. The taller species, *P. tenax*, is suitable for boundary fences, and the smaller drooping *P. Colensoi* is suitable for subdivision lines in the garden. *Cordyline australis*, the cabbage tree, is suitable for any soil or station, however poor or exposed, but the finer *C. indivisa*, the toi palm, requires a very deep soil. *C. Banksii* casts but little shade, but is more ornamental than the cabbage tree, and, like it, adaptable to poor soil or exposed stations. The cabbage tree is a fine shelter tree on many poor tussock-clad hills bare of bush or other shelter. The sheep crowd together under the shade cast by the huge tufts of the branching cabbage tree, which has the merit of not affecting the grass growing right up to the base of the trunk. All *Cordyline* species are easily propagated by seed, by cuttings, or by layering from the trunk. At Karitane, Otago, it was found that nothing tried (except *Olearia Traversii*), outstrips the cabbage tree in rapidity of growth, and the extreme ease of propagation by seed makes it one of the best trees for extensive planting on the seaside. Once established it is very hard to kill, and will sprout vigorously if the head is cut off. The highly ornamental bronze variety is on the market. A combination of New Zealand flax outside and two or three rows of cabbage trees inside has been recommended for screening off the southerly blizzards which do so much damage on the Taranaki coast.

The *Rhopalostylis sapida* (the nikau palm) is a charming as well as ornamental shelter plant suitable for lawns where a grove of trees is desired without the attendant drying of the soil. Many gardens in the Hutt district derive quite a tropical look from one or more nikau palms, and if these are arranged in lines or groups the effect is very fine. Plants in windy situations become rather battered, but the coastal scrub south of Cape Farewell, receiving the full force of the westerly winds from the Tasman Sea, consists of a pure stand of nikau, a circumstance which shows its relative hardiness compared with other palms. The Kermadec Id. (*R. Cheesemani*) is a more beautiful palm which should be more generally grown in the warmer parts of the North Island. All these liliaceous or palmaceous plants produce either fruits or nectar-bearing flowers, sometimes both, which are sought for eagerly by birds, and therefore should be planted to the exclusion of exotics having no such qualities.

Another unusual hedge plant which is promising to succeed is *Arundo conspicua* (toe toe or New Zealand plume grass) easily propagated by root division or by seed if it can be secured before the birds get it. Besides forming good shelter belts, the clumps produce fine flowering plumes which come on earlier than those of the South American pampas grass.

A group of plants employed in the South Island as hedge plants are the olearias. One of these, *O. Traversii* (Chatham Islands ake ake), Matthews states is one of the best hedge plants for standing near the coast; inland it becomes a poor scrubby nearly leafless shrub. It is fast growing and stands clipping well, can be easily raised from cuttings taken about March, but requires frequent trimming to make a compact, dense hedge. At Scarborough, England, this species has succeeded in giving shelter at the coastal promenade, where nothing else could be grown. It produces a fragrant wood suitable for ornamental boxes, and is called locally "sandalwood." *Olearia paniculata* (*Forsteri*) akiraho is stated by Matthews to be one of the best ornamental hedge plants, and equally valuable for specimen or shelter purposes, growing on any soil if not wet, endures frost well, is fast growing, stands clipping, and from February to April is easily increased by cuttings 12 inches long inserted in moist, shaded, sandy soil for about two-thirds the length; a treatment which succeeds with most cuttings. This species has highly attractive leaves with margins strongly undulate, and scented flowers borne in the late autumn. Cockayne ("Cultivation of New Zealand Plants," 1923, p. 125) recommends the above olearias as suitable for hedges, and also the two sister species *O. ilicifolia* and *O. macrodonta* (both known as the New Zealand holly) and the nearly allied *Senecio rotundifolius*, the leather leaf (puheritaiko), and at Karitane King reports that this species and *Olearia Traversii* are the most valuable of the composite shrubs. Sir Truby's experience is that unfortunately groups of senecios or olearias are liable to lose individual plants, which although still young and apparently in full vigour are liable to sickness and die suddenly, a disability which limits the use of this family as hedge plants. The writer has observed this of many composites, and attributes it to the attacks of some underground pest working at the root. *Olearia furfuracea* in the writer's shrubbery gives promise of succeeding in a very poor soil and windy exposed situation as a low shelter belt, and *O. Haastii* has a standing in the Northern Hemisphere as a hardy shrub for the back of the border, and certainly it grows very well with the author.

For shelter belts and quick hedges in exposed, stony, dry situations, nothing can surpass *Dodonaea viscosa* (one of several plants called ake ake by the Maori), which is also found in many warm countries, and hence must have something more than a New Zealand history. The wood is hard and heavy, and was formerly much used by the Maori for making clubs and spears, and by settlers for making mauls. The bark of mature plants is of a delightful cinnamon colour. Plants are easily

raised from seed, and it is one of the most quickly growing of New Zealand trees, having a wide range in habitat, from North Cape to Banks Peninsula and Greymouth. Mr. H. Lawton has discovered, in Marlborough, a bronze variety, which he states comes true from seed and is giving promise of becoming a first-class ornamental shrub on the New Zealand market.

(To be continued.)

THE MARLBOROUGH HAREBELL.

(*WAHLENBERGIA MATTHEWSII*.)

BY B. C. ASTON, F.N.Z.Inst.

The pale lilac flowers of this lovely plant have now become an arresting sight to those seeking horticultural inspiration in the Gresley Lukin Alpine Garden at the Otari Open Air Plant Museum, Wadestown. A clump of this Marlborough species was planted near a boulder in 1929 in a well lighted situation, and seeds have wandered across the path, germinated, and produced mature plants which flowered this year, so that the moraine garden has been strengthened by the domestication of an outstanding horticultural novelty, the first success in this respect which can be credited to Dr. Cockayne's comprehensive scheme, the key note of which is to be beauty. It is fortunate that this early achievement administering to the aesthetic needs of man has been of a kind that all gardeners can appreciate, and that the novelty has made its debut not only at Wilton's Bush but at Vincent Square, Chelsea, the Mecca of British gardeners and the permanent headquarters of the Royal Horticultural Society. Seeds were gathered from the Alpine Garden and sent to Major F. C. Stern, in 1929, and raised by him, and were happily the object of an Award of Merit by the Royal Horticultural Society in the following terms (see p. xxxvi., Journal of the Royal Horticultural Society, January, 1931):—

"To *Wahlenbergia Matthesii* as a hardy flowering plant (votes unanimous), from F. C. Stern, Esq., Goring-by-Sea. A species from New Zealand. The bushy plants are one foot high, with numerous erect slender stems. The foliage is linear, the flowers terminal, about 1 inch in diameter, white, flushed with pale blue."

As recorded in the "Gardeners' Chronicle," July 1930, p. 16, the Award is as follows:—

"*Wahlenbergia Matthesii*: A New Zealand plant of elegant habit and bearing relatively large, widely-expanded white flowers, flushed with pale blue. The small, linear leaves are of rich green colour. Shown by F. C. Stern, Esq., Highdown, Goring-by-Sea."

This harebell belongs to a very distinguished company of related plants of 55 genera and 1000 species, many grown in gardens for superiority in two out of the three attributes which make for excellence in flowers. Two of these, form and colour, are present to a conspicuous degree in all plants of the Bell family or Campanulaceae of the botanist. The third attribute, fragrance, is seldom present. No one with any taste in gardening will dispute the popularity of these plants whether for the rock garden, the moraine garden, or the open border. Indeed, one or two are so tall that they may be placed at the very back of the border or amongst shrubs. They range in colour from white to pink and all shades of blue, but in form all shapes of the bell may be found, from the tiniest rock plant with a multitude of nodding bells to the larger sorts known as "cup and saucers," which make such brilliant shows in the flower beds, the climax being reached in the regal pink-flowered *Ostrowskia magnifica*, six to ten feet high, which must be seen to be believed. The little New Zealand stranger can hold up its bells with the best of the family, and because of its hardiness, one would almost say its pluck, and the ready way it responds to the efforts of the rock gardener, a smiling future may be predicted for it.

Henry John Matthews was the son of George Matthews, who in the early days of horticulture in New Zealand established in Dunedin a nursery business, making a prominent feature of the growth and sale of what he called native plants. A catalogue devoted to New Zealand plants, issued by this firm in the 'eighties, gives the following information:—

Some 21 named species of *Celmisia* are given, and the statement that 30 are altogether available, some unnamed; 15 species of *Olearia*, 14 species of *Senecio*, and 50 species of *Veronica*. In addition to these there are about 100 named ferns and about 100 other New Zealand trees, shrubs and herbs, as well as collections of New Zealand plant seeds advertised for sale. Included in plants for sale are: *Ranunculus Lyallii* and *R. Buchananii*, the latter one of the finest members of this genus, and a species which is seldom grown though a prize was given to Matthews for it at an early Horticultural Show in Dunedin. The large-flowered *Gentian*, now known as *Gentiana corymbifera*, was also listed for sale, so it will be seen that this firm had learnt how to grow for the market certain rare alpine plants which are not now available. Many consignments of New Zealand plants were sent to England and other countries, and this no doubt laid the foundation for the appreciation of New Zealand plants as horticultural subjects in the Old World.

The author of this note, in the late 'nineties, derived considerable information on the growth of New Zealand plants from the frequent visits to the nursery and grounds attached to the Matthews home at Hawthorn Hill, Mornington, some 700 feet above sea level. The business was then carried on by Henry Matthews, who became an enthusiastic plant hunter, and greatly increased the number of species grown and improved the methods of growing them. All parts of New Zealand

were visited by him, and yielded treasures which beautified the specially constructed rock gardens and borders which became a distinctive feature of the gardens. Plant lovers were always welcomed to inspect the large stock of plants usually regarded as difficult to grow, but which it was found could easily be grown at this altitude in specially trenched ground reinforced by soil taken from the nearby mountain, Flagstaff Hill. In this way such plants as *Ranunculus Lyallii* and the other handsome sister species, as well as rare Southern Island plants, were grown and distributed. Henry Matthews was careful to dry specimens of anything he discovered strange to him. These were sent to the working botanists of the day and are now to be found in the herbaria of those late workers, Thomas Kirk, T. F. Cheeseman, and D. Petrie, as well as of those fortunately still with us, notably Dr. L. Cockayne. Henry had learnt the trade of joiner, which gave him the working knowledge of New Zealand timbers, and this stood him in good stead when the Seddon administration were looking for a Chief Forester, to which position he was appointed in the year 1900. He was largely responsible for the planting scheme carried on at Rotorua and elsewhere, which developed into the modern Forestry Department of the New Zealand Government. Besides the subject of this note, other plants named after him are: *Ranunculus Matthewsii* (T.F.C.), *Epilobium Matthewsii* (D.P.), *Veronica Matthewsii* (T.F.C.), and *Festuca Matthewsii* (T.F.C.). A useful manual on tree culture in New Zealand was published from his pen in 1905 (Government Printer). He died in 1909.

In one of the excursions to Marlborough, about the year 1905, Matthews discovered several curious-looking plants on a rock, and one of these was the *Wahlenbergia*, which he gave to Dr. Cockayne, who, with the true caution of the botanist, put it aside until it should be confirmed by further enquiry. In 1915, in the company of a party traversing the foothills of the Kaikoura Mountains, the writer re-discovered this plant, enabling Dr. Cockayne to describe it fully in the Transactions of the New Zealand Institute, Volume 47, 1915, p. 113. It was not until the Otari Open Air Plant Museum was established that an opportunity of growing rare New Zealand plants under skilled supervision enabled the horticultural possibilities of this beautiful species to be fully examined.

T. F. Cheeseman, in his introduction in the "Manual of the New Zealand Flora," p. xxxv., History of Botanical Discovery in New Zealand, pays the following tribute:—

"Mr. H. J. Matthews, the present head of the Forestry Department, has collected in many parts of the colony, adding largely to our knowledge of the range of the species, and obtaining a few novelties, notably the beautiful *Ranunculus Matthewsii*, described in the appendix to this work. He has also done excellent service in forming an extensive collection of living plants in his garden at Dunedin, especially of the rarer alpine and sub-alpine species. If this collection is maintained and

extended it will prove invaluable for affording the means of leisurely study and comparison in difficult genera like *Veronica* and *Celmisia*, etc."

Dr. L. Cockayne, in his "Vegetation of New Zealand," 1928, p. 14, speaks of Matthews' "famous garden," and on p. 376, in discussing forestry in New Zealand, commends Matthews' work as follows:—

"To begin with, this essential national work was placed in the hands of the Department of Lands and Survey, and for a number of years it was ably directed by the late H. J. Matthews, whose name must ever stand high as a pioneer of New Zealand commercial forestry; nor must it be forgotten that much of his work was necessarily of an experimental nature."

Although the desire for some place for the study of New Zealand plants in the living state was realised, it is characteristic that systematic botanists, even when they are gardeners, do not see the essential need for an institution which must be much more than a garden where the plant may be studied as far as possible in a natural setting as a living species and not as a mummified specimen with Latin name and description, just as mystifying to the average plant lover as would be the hieroglyphics on Tutankhamen.

One of the minor pieces of work carried on at Otari is the labelling of plants with suitable popular names. To do this successfully one must be something of a poet. Fortunately the founder of the Museum has a full appreciation of the beauty of words, and suggests "Marlborough Harebell" as the name for this new garden plant, which all will agree is as charming as the plant itself.

SUMMARY OF PROCEEDINGS OF NINTH ANNUAL CONFERENCE.

Held in the Municipal Buildings, Manchester Street, Christchurch, on Wednesday, 27th January, 1932, at 2 p.m.

Reports.—The following reports were received and adopted:—

1. Executive (with Statement of Accounts)—see Journal of September, 1931.
2. Examining Board—see Journal of September, 1931.
3. Plant Registration—as printed herein.

Election of Officers, etc.—

President: F. J. Nathan, Esq., Palmerston North.

Vice-Presidents: Messrs. D. A. Hay (Auckland), Frank E. Smith (Hawke's Bay), P. Black (Manawatu), J. G. MacKenzie (Wellington), Dr. T. H. Easterfield (Nelson), M. J. Barnett and T. D. Lennie (Christchurch), Hon. Sir T. K. Sidey and D. Tannock (Otago), and Jas. A. McPherson (Southland).

Executive Committee: Professor H. B. Kirk, Messrs. J. A. Campbell, T. Waugh, H. Baillie, R. B. Hammond, W. R. B. Oliver, F. S.

Pope, W. C. Hyde, W. T. Goodwin, W. S. Mason, G. A. Green, B. C. Aston, T. C. Brash and A. H. Cockayne.

Auditor: Mr. L. C. Gibbins.

Honorary Fellows: Messrs. Peter Black (Palmerston North), and A. H. Cockayne (Wellington).

Honorary (Overseas) Members: Messrs. F. J. Chittenden (London) and Ronald G. Hatton (East Malling, England).

REMITTS ADOPTED.

1. *Examining Board*: That there be added to the Examining Board three members, to be elected by the District Councils of Auckland, Canterbury and Otago respectively, and that these District Councils be associated through their respective representative.
3. *National Societies*: (After a full discussion it was decided that the Executive Council should refer these proposals back to the District Councils for further consideration.)
5. *Honorary Members*: That not more than two Honorary (Overseas) Members and one Honorary Fellow be elected annually, the Fellow to be a resident of New Zealand at the time of his election.
6. *Membership*: That all holders of the Institute's Diploma be urged to join the membership of the Institute.
7. *National Championships*: That provision be made for the establishment of National Championships in horticultural classes at National Shows if sufficient inducement offers. In the meantime Provincial Championships might be arranged by collaboration of the Horticultural Societies in each province.
8. (b) *Botany and Science*: That the Government, the Education Department, and the Senate of the University of New Zealand be urged to provide for the teaching of Botany and General Experimental Science in all post-primary schools by putting them on the same or a preferential basis to Chemistry and Physics, and to make the necessary provision to enable the change to be made.
8. (c) *Horticultural Classes*: That District Councils be urged to make every effort to secure (a) the establishment of horticultural classes for students in their respective localities, and (b) their continuance.
9. *Youth Training Centres*: That the Government be urged to provide camps near the chief cities to enable youths desirous of entering horticultural occupations to have at least a month's intensive training, preferably on unimproved land, before starting work.
10. *Florists and Seedsmen's Certificates*: That provision be made for the granting of certificates to Florists and Seedsmen (after examination) as soon as circumstances permit.
11. (a) *Forest Preservation*: That this Conference expresses its high appreciation of the action taken by the Government during the past year to suppress deer and other browsing animals which destroy the trees and young plants on the floor of the forests, and urges the continuance of these efforts until this danger to our forests is entirely removed.

11. (b) That all District Councils be urged to further the action of the Government in the direction of preserving our native forests from the ravages of imported animals.
12. (a) That in view of the opening of the road through the Waioeka Gorge (Opotiki-Gisborne Road) the local District Council be requested to confer with other local bodies interested to secure the permanent reservation of the forest area in the gorge.
12. (b) That this Conference urges the continuance of efforts to secure the preservation of the native forest in the Waipoua and Waikaremoana districts.
13. (a) That the Government be urged to reserve for scenic purposes all suitable native bush areas not urgently required for other purposes.
13. (b) That the Government be requested to assist settlers to preserve bush of scenic value facing any highway, railway, or navigable river, by providing for the deduction of the value of such bush from the rateable value of such land whilst preserved, provided that the consent of the local authority be first obtained.
14. *Plant Patents*: That in view of the urgent need for the provision of adequate protection for the discoverers of new varieties of plants, this Conference strongly urges upon the Government the need for the setting up of a Nomenclature Board, with statutory powers to prohibit the sale of a plant under a name other than that adopted for it by the Board. It is further suggested that an amendment to the New Zealand Institute of Horticulture Act, 1927, be passed, giving the Institute the powers of the Nomenclature Board.
15. (a) *Citrus Research*: That this Conference urges upon the Government the necessity for the early establishment in the Auckland district of a Test Area for citrus and other suitable sub-tropical fruits.
15. (b) That the Government be urged to set aside a site where the test trees for the Auckland area can be grown under constant and suitable control on a permanent location, e.g., in connection with an Agricultural High School for Auckland.
16. (a) *Botanic Gardens*: That the Institute, through its Secretary, act as a clearing station for the distribution to N.Z. Superintendents of Reserves of lists of seeds, etc., available in N.Z. for distribution by exchange.
16. (b) That local bodies be urged to make use of the Government's No. 5 Scheme for the provision or extension of local botanical gardens.

OTHER BUSINESS.

Dahlia Register.—The suggestion of the N.Z. Horticultural Trades' association that the Institute should keep a register of Decorative and Cactus Dahlias catalogued, imported or raised in New Zealand, was referred to the Executive Council for consideration.

Permanent National Show Committee.—Mr. J. A. Campbell was appointed to represent the Institute on this.

Location of Next National Conference on Horticulture.—Mr. J. A. Campbell was appointed to represent the Institute on this committee. It was further decided to recommend Wellington as the place of meeting.

Dr. L. Cockayne.—On the motion of the President, Dr. Cockayne was heartily congratulated on having conferred on him the honorary degree of Doctor of Science of the New Zealand University.

PROTECTION FOR GROWERS OF NEW VARIETIES OF THEIR OWN RAISING. (Committee's Report.)

1. One of the objects of the Institute, as embodied in its constitution, is "to exercise all the powers and functions of a horticultural nomenclature and certificating Board, including the making of decisions and reports in regard to the nomenclature of plants, and to issue, in the name of the Institute, certificates, medals or diplomas for novelties of merit or new varieties." The objects of the Institute, including the one quoted above, are embodied in the preamble to the New Zealand Institute of Horticulture Act, 1927.
2. At the Auckland (1929) annual conference of the Institute the proposal that the Institute should undertake plant registration received favourable consideration, and the next year inaugurated a system of "plant recording" which gives some measure of protection to the raisers of new varieties but without placing on the Institute any responsibility beyond the actual recording of applications made.
3. The "plant recording" scheme referred to above was as much as the Institute was in a position to undertake at the time, but it was felt that at a later stage it would be necessary to provide for a Certificating Board having power to test out new varieties submitted, and, when justified, to grant awards.
4. The Canadian Horticultural Council has, since 1923, conducted a system of plant recording and registration, covering the testing of the plant and investigations as to its originality. The Canadian Trade Marks Act applies to plants, and in 1928 the name "Lady Canada" as applied to a Rose, was registered as a trade mark. The Canadian Horticultural Council has not encouraged the taking out of trade marks for plants because the trade mark merely covers the *name* of the plant and is no guarantee of merit. By stressing the Plant Registration Bureau of the Council it is hoped that plants registered thereunder will be considered of outstanding merit.
5. In 1930 the United States Congress passed a Plant Patents Act covering asexually reproduced distinct and new varieties of plant, other than a tuber-propagated plant, but at latest advice, although many applications had been made for patents no patent had been issued, as several difficulties had arisen in the handling of the applications.

6. The New Zealand Trade Marks Act, in common with the Canadian Act, will, it is understood, protect the name of a plant if such is registered as a Trade Mark. The Act protects the mark only, or in the case of a plant the name, but it does not protect the plant under any other name. To be of any real value for the purpose aimed at registration under the Trade Marks Act will require to be supported by action in other directions.
7. In Canada one objection to unrestricted registration is the fact that low quality plants may be covered by protected names, and would in consequence receive an unwarranted advertisement, to the detriment of the public. The same objection would apply in New Zealand also.
8. The two objections, i.e., the selling of a registered plant under another name, and the undue advertising of registered plants of low quality might be met by:
 - (a) The setting up of a Nomenclature Board having statutory authority. This might be done by an amendment to the N.Z. Institute of Horticulture Act, the object being for such a Board to have power to prohibit the sale of a plant under any other name than that officially adopted by the Board. Consequently, if a valuable plant having a duly registered name were being raised and sold under another name for the purpose of defeating the scheme, action could be taken through the Board that would effectively put an end to the practice.
 - (b) Some body such as the Institute to undertake a scheme of testing, and the issuing of awards of merit relative to new plants. Were this done it would mean that the mere registration of a plant would mean little as an advertisement, but it would be of considerable value if supported by an award of merit.
9. The matter of testing new plants with a view to issuing awards of merit has been under consideration by the Institute for some time past, but action has been delayed owing to the question of finance, the work of raising and testing new plants envisaging the establishment of a horticultural station with all the necessary equipment, including glasshouses, etc.—a matter quite beyond the financial power of the Institute at the present time. It has, however, been suggested, that the Institute, working in co-operation with the Directors of Municipal Gardens and the leading Nurserymen of New Zealand might well proceed, the idea being to utilise the facilities thus provided in the direction of having the plants under test properly cared for. This idea is, in the meantime, being developed, and at the moment there appears to be no serious difficulties in the way of such co-operation being established.

BANKS LECTURE.

The lecture for 1932 was given by Robert Nairn, Esq., of Christchurch, who took for his subject "The Early History of Horticulture in New Zealand." The lecturer dealt very interestingly with his subject

and placed on record much information which will prove of great value to future writers on the horticultural history of the Dominion. A copy of the lecture is being sent to members as a supplement to this issue of the Journal.

NATIONAL CONFERENCE ON HORTICULTURE.

The second National Conference on Horticulture, held in Christchurch, consisted of the annual gatherings of the Institute, the New Zealand Horticultural Trades' Association, and the Association of Directors of Parks and Reserves. The delegates were given a civic welcome by Rev. J. K. Archer on behalf of His Worship the Mayor, after which the Conference was officially opened by the Hon. Sir R. Heaton Rhodes in the absence of the Right Hon. the Prime Minister. After the annual meetings of the bodies mentioned, they, in conjunction with the Canterbury Horticultural Society, held the second National Flower Show in the King Edward Barracks. The Show was a great success. One of the outstanding features was Mr. Henry Bennett's display of over 800 varieties of New Zealand plants in connection with the Loder Cup competition.

EXAMINATION PAPERS, NOVEMBER, 1931.

PRELIMINARY EXAMINATION (Syllabus No. 1).

HORTICULTURAL BOTANY.

1. Describe with sketches the seed, the mode of germination and the seedling of the following plants:—(a) Pea; (b) Wheat; and (c) Vegetable Marrow.
2. Describe the minute structure of a green leaf, and show how it is specially fitted for absorbing and liberating certain gases.
3. Trace the path followed by a particle of water from its entrance into the root hair to its exit as vapour from the leaf.
4. What are the main functions of roots and how are they adapted to carry out these functions?
5. What is a vascular bundle? Of what parts do the vascular bundle of a dicotyledon consist, and what are their respective functions?
6. Give an account of the structure and function of a pollen grain.
7. Describe the main features of the family Compositae, compare them with those of the family Umbelliferae, and give three genera belonging to each family.
8. Name six grasses you are likely to find in pastures, and six weeds that may also be present.
9. Describe fully two potato diseases, one which affects both leaves and tubers, and one which affects only the tubers.
10. Describe in technical language the botanical specimen, Iris (root, stem, leaf and flower), supplied.

Note.—*Six only* of the above questions are to be answered, of which the last is *compulsory*.

PRELIMINARY EXAMINATION (Syllabus No. 1).

HORTICULTURAL ZOOLOGY.

1. Describe the general characters, life history and habits of a spider, a wood-louse and a silver-fish.
2. Describe the general structure of the adult, pupal and larval stages of (a) a two-winged fly; (b) a four-winged fly; and (c) a butterfly.
3. Give a full account of the life history of the New Zealand grass grub, and any species of thrips you may know.
4. What is meant by (a) cultural control; (b) chemical control; and (c) biological control; and give examples of each.
5. What are the main insects likely to affect stored grain, and how are they best controlled?
6. Give the main poison insecticides in common use, how are they prepared, and against what insects are they used?
7. What are the main symptoms of infestation by aphids and by scale insects? On what garden plants are they most likely to be found, and what are the measures for their repression?

Note.—*Any six only* of the above questions are to be answered.

INTERMEDIATE EXAMINATION (Syllabus No. 2).

THE PRINCIPLES OF HORTICULTURE.

1. What are the chief advantages pertaining to crop rotation?
2. Water is held in the soil in one or all of the three forms—free, capillary or hygroscopic. Describe what these terms mean and state what influence they have on soil fertility.
3. What is meant by a physical analysis of soil, and what is the lesson that such an analysis teaches?
4. Nitrogen is an element frequently in short supply in soils. How would you increase it—
 - (a) without the aid of chemical manures,
 - (b) with the aid of chemical manures—specifying those you would use?
5. Describe the biological effect of soil sterilisation.
6. What is the distinction between bacterial and fungus diseases of plants? Give examples of both.
7. What are the chief elements entering into the composition of plants? Give their approximate percentages and state from what source they are obtained.
8. Write a short essay on the principles of drainage, and show by diagram how you would place the underground pipes.
9. Name some of the principles in common use having for their object the conservation of soil moisture.

Note.—*Any six only* of the above questions to be answered.

INTERMEDIATE EXAMINATION (Syllabus No. 2).

THE PRACTICE OF HORTICULTURE.

1. Take *any one* of the following plants and fully describe your system of pruning:

(a) Apple; (b) Plum; (c) Rose; or (d) Peach.

Give reasons for your practice.

2. Describe the advantages of green manuring, and give examples of crops, either singly or in combination, suitable for this purpose.
3. What are the general principles governing the cultivation of rock plants?

or

Choose twelve kinds of rock plants to be named by you and describe their mode of natural increase.

4. Explain your mixtures of manures for (a) a light soil; (b) heavy soil; (c) peat lands.

Give an approximate analysis of your mixtures.

5. Write a short essay on *one only* of the following methods of plant propagating:

(a) grafting; (b) layering; or (c) cuttings.

6. How would you lift, mature and store the following sorts of bulbs or corms:

(a) Hyacinths; (b) Tulips; (c) Narcissus; (d) Lilliums;
(e) Anemones; (f) Freesias.

Note.—*Any three only* of the above questions to be answered. Also, *any three only* of the questions on the special subject nominated.

INTERMEDIATE EXAMINATION (Syllabus No. 2).

Special Subject: THE FLOWER GARDEN IN ALL ITS ASPECTS.

1. Describe in detail the method of propagating and growing one only of the following plants:
 (a) Phlox (herbaceous); (b) Chinese Paeonie; or (c) Delphinium.
2. Give a list of six plants suitable for planting in a dry situation, and provide brief notes on each.
3. State in detail your method of growing any popular flowering bulb to be selected by you.
4. Write a short essay on the garden Iris.
5. Give a list of eight summer flowering plants, the seeds of which may be sown in the open ground.
6. Show by diagram your system of pruning Roses, and give reasons for your methods.

Note.—*Any three only* of the above questions to be answered, *in addition to any three only* of the questions on "The Practice of Horticulture."

INTERMEDIATE EXAMINATION (Syllabus No. 2).

Special Subject: NURSERY MANAGEMENT.

1. Give a list of nine sorts of plants that can be economically increased by layering, and state the time and method you would adopt with the several kinds enumerated.
2. What stocks do you suggest should be used for the following fruit trees:

- (a) Apple; (b) Pear; (c) Plum; (d) Peach; (e) Apricot;
(f) Cherry.
3. At what time and at what depth would you plant the following bulbs or corms :
(a) Crocus; (b) Tulip; (c) Hyacinth; (d) *Lilium Tigrinum*;
(e) *L. Auratum*; (f) Anemone; (g) *Ranunculus*?
 4. Describe how you would raise a crop of *Pinus Radiata* from seed-sowing till selling age at two years old.
 5. Describe your method of packing for rail the following :
(a) fruit trees; (b) hedge plants; and (c) pot plants (4in. or 5in. pots).
 6. Sterilisation of soil is now a recognised practice in nurseries. Describe how it is done and state its advantages.

Note.—*Any three only* of the above questions to be answered, *in addition to any three only* of the questions on "The Practice of Horticulture."

PROFESSIONAL (DIPLOMA) EXAMINATION (Syllabus No. 3).
PRINCIPLES AND PRACTICE OF HORTICULTURE.

1. What are the chief advantages pertaining to crop rotation?
2. What is meant by a physical analysis of soil, and what is the lesson that such an analysis teaches?
3. What is the distinction between bacterial and fungus diseases of plants? Give examples of both.
4. What are the chief elements entering into the composition of plants? Give their approximate percentages and state from what source they are obtained.
5. Take any *one* of the following plants and fully describe your system of pruning :
(a) Apple; (b) Plum; (c) Rose; or (d) Peach.
Give reasons for your practice.
6. What are the general principles governing the cultivation of rock plants?

or

Choose twelve kinds of rock plants to be named by you and describe their mode of natural increase.

7. Explain your mixtures of manures for (a) a light soil; (b) heavy soil; and (c) peat lands. Give an approximate analysis of your mixtures.
8. Write an essay on the various methods of vegetative propagation.

Note.—*Any six only* of the above questions to be answered.

PROFESSIONAL (DIPLOMA) EXAMINATION (Syllabus No. 3).

Special Subject: FLORISTS' ART.

1. Describe the most suitable methods for growers to pack cut flowers for transport to a distance.
2. Name six each, under respective headings, of (a) annual plants;

(b) herbaceous and bulbous perennials; and (c) shrubs, the flowers of which are in general demand by the floral trade,

and

Over what periods of the year is each of the foregoing available?

3. What varieties of Chrysanthemums and Roses are most useful for floral designs and decorations?
4. What may be done to keep the different kinds of cut flowers in good condition as long as possible?
5. What Orchids, suitable for floral work, are available here? Over what period can each be obtained?
6. Discuss the main floral novelties that have appeared in the cut flower trade during the last few years.

Note.—All of the above questions are to be answered.

PROFESSIONAL (DIPLOMA) EXAMINATION (Syllabus No. 3).

Special Subject: GLASSHOUSE MANAGEMENT.

1. Choose *one* of the following plants and write a short essay on its propagation and management:
 - (a) Begonia; (b) Cyclamen; (c) Calceolaria.
2. Detail your method of raising Tomato plants under glass for outside planting—(a) seed sowing; (b) pricking out; and (c) hardening off.
3. Describe a method of grafting under glass evergreen plants such as the Rhododendron, and explain the vital difference between this and the grafting of deciduous subjects.
4. What is meant by "bottom heat," and what is its special feature for propagating purposes?
5. Why is the modern trend of glasshouse construction towards the larger houses, and what are the advantages claimed for them?

or

Give a critical review of the arguments for and against the large houses.

6. Describe the raising and growing of Palms under glass, and name the more profitable kinds.

Note.—All of the above questions are to be answered.

INSTITUTE NOTES.

1931 *Examinations*.—The following passes were recorded:—

Junior Certificate: Herbert Allen (Auckland), Robert Wilson Balch (Christchurch), and Milford Robert Boothby (Dannevirke).

Senior Certificate: Cyril Robert Nodder (Auckland), Stanley Rowland Hughes (Wellington), John Gretton Carr MacKenzie, and Miss Bina Elizabeth Martin (Dunedin).

Diploma (Group B): Miss Margaret Elspeth Watt (Ambler, Penn., U.S.A.), Brendan Percival Mansfield (Napier), and Charles Gordon Burgess (Christchurch).

Certificates in Fruit-culture.—Rules for the conduct of examinations have been adopted, and a number of applications have already been received.

Examination Rules.—Students for Certificates in Horticulture may now, after one year of recognised practical garden service, be examined in the theoretical subjects, but the oral and practical portion of the examination cannot be taken until completion of the two years of recognised garden service prescribed.

Candidates for the Diploma who do not sit before the November, 1932, examination will be required to submit a thesis bearing on the special subject nominated by them. The subject for the thesis must be submitted to the Examining Board not less than eight months before the date for the examination and the thesis itself forwarded to the Examining Board not less than three months before the examination date.

Rules for Judging at Horticultural Shows.—These will be finalised early. It is hoped that all Horticultural Societies throughout New Zealand will adopt these rules, and so secure uniformity of action at all shows.

HORTICULTURAL SHOWS

AUCKLAND HORTICULTURAL SOCIETY.

President Sir Edwin Mitchelson, K.C.M.G.

Secretary: N. C. Pearce, c/o. Box 168, Auckland.

Dahlia Show: 3-4 March, 1932.

Chrysanthemum Show: 21-22 April, 1932.

Daffodil Show: September, 1932.

Rose Show: November, 1932.

Summer Show: December, 1932.

Rose Show held in Reception Hall of Milne & Choyce Ltd. All others at Scots Hall, Symonds Street.

HAMILTON HORTICULTURAL SOCIETY.

President: H. M. Hammond, Esq.

Secretary: Miss P. C. von Sturmer, 101 Collingwood Street.

Autumn Show: 8 March, 1932.

Chrysanthemum Show: About 20 April, 1932.

Spring Show: September, 1932.

Summer Show: November, 1932.

WELLINGTON HORTICULTURAL SOCIETY.

President: Mrs. Knox Gilmer.

Secretary: A. R. Stone, G.P.O. Box 1237.

Autumn Show: 27 April, 1932.

Spring Show: September, 1932.

Summer Show: November, 1932.

All Shows held in Town Hall, Wellington.

HUTT VALLEY HORTICULTURAL SOCIETY.

President: N. B. Gibbons, Esq.

Secretary: A. J. Nicholls, P.O. Box 19, Lower Hutt.

Autumn Show: 20-21 April, 1932.

Spring Show: September, 1932.

Summer Show: November, 1932.

Mid-Summer Show: February, 1933.

All Shows held in King George Theatre, Lower Hutt.

MATAURA HORTICULTURAL AND INDUSTRIAL EXHIBIT SOCIETY.

President: J. J. Griffiths, Esq.

Secretary: James Ingram.

Spring Show: October, 1932.

Annual Show: February, 1933.

All Shows held in Society's Hall, Mataura.

NEW ZEALAND INSTITUTE OF HORTICULTURE (INCORPORATED)

Patrons: Their Excellencies LORD BLEDISLOE, Governor General, and
LADY BLEDISLOE.

Vice-Patron: The Hon. the Minister of Agriculture.

President: F. J. NATHAN, Esq., Palmerston North.

Dominion Secretary: A. R. STONE, G.P.O. Box 1237, Wellington.

Dominion Organiser: GEO. A. GREEN, 16 Aratonga Avenue, One Tree
Hill, Auckland.

Hon. Secretaries of Local District Councils:

Auckland: N. R. W. Thomas, 9a Customs Street, West.

Hastings: W. M. H. Diamond, 611 Nelson Street.

Palmerston North: J. J. Stevenson, Boys' High School.

Nelson: E. R. Neale, P.O. Box 114.

Christchurch: C/o J. N. McLeod, 108 Paparoa Street, Papanui.

Dunedin: Geo. H. McIndoe, P.O. Box 445.

Invercargill: G. M. Broughton, P.O. Box 91.

Membership:

Individuals: 12/6 per annum.

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To Non-members: 5/- per annum (in advance).

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Wellington.

Advertising Rates:

These will be supplied on application.

Examinations:

Examinations are held half-yearly (June and November).

Students desiring examination should make early appli-
cation to

DOMINION SECRETARY,
N.Z. Institute of Horticulture,
G.P.O. Box 1237, Wellington.