

**JOURNAL
OF THE
NEW ZEALAND INSTITUTE
OF
HORTICULTURE**



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EXAMINATIONS

Examinations for the following are conducted by the Institute:—

1. Junior Certificate in Horticulture.
2. Intermediate Certificate in Horticulture.
3. Diploma in Horticulture.
4. Seedsman's National Certificate.
5. National Certificate in Florists' Art.

Examination Papers

Sets of examination papers used at the last six examinations in horticulture are obtainable on application for sixpence per examination set.

Address all correspondence to:

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Wellington.

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No. 3.

THE CONSTRUCTION OF FERNERIES IN NEW ZEALAND.

By David Hull, New Plymouth.

Of recent years, much interest has been taken in the native flora of this Dominion by New Zealanders generally, and by amateur gardeners in particular. At least a few specimens of native trees and shrubs are to be found in most private gardens, and a number of extensive collections are established in our parks and reserves, as well as in private gardens owned by enthusiasts.

Arising from a passing interest in native ferns, some amateur gardeners have planted a tree fern or two, and a few of the smaller ground ferns in shady portions of the garden. In this fashion, beauty and grace have been added to shady areas, and the tree ferns have provided a background that adequately enhances the beauty of many gardens. Quite a number of amateur gardeners, who have also a love of the native forest, have made a start with a few ferns. Further interest has resulted from visits to ferneries in parks and at the homes of friends, until a much stronger interest is created, and the collecting and growing of ferns, as an instructive and satisfying hobby, has been decided upon.

Throughout the world there are about one hundred and sixty genera of ferns, with over six thousand known species. Nature has been lavish to this Dominion by providing us with thirty-one genera, contained in which are approximately one hundred and forty-five well-authenticated species, and approximately thirty-five well-authenticated varieties. Thus we have a total of approximately one hundred and eighty species and varieties of native ferns. Very few ferneries, in New Zealand or elsewhere, contain specimens of all the New Zealand ferns, and it can confidently be said that the attainment of this goal would take some years.

There are very few districts in the Dominion that are not suitable for the growing of most of our ferns in suitably protected spots or in ferneries. To those who contemplate more interest in ferns and ferneries, the writer offers, purely as an interested amateur, suggestions and information on the construction and establishment of various types of ferneries.

It is desirable, when collecting ferns, to observe the particular type of habitat of each, and to endeavour to imitate these as near as possible in the fernery. An endeavour should be made to copy and create the atmosphere of our native bush. To grow ferns successfully, they should be protected from winds and draughts and, with the exception of the swamp-loving species and a few other species, should be provided with good drainage—preferably by growing on banks or terraces. For the “filmy” ferns, *Hymenophyllum*—and the “Prince of Wales Feathers” fern, *Leptopteris superba*, a special location, with still damp air, should be constructed in the fernery.

Three of the most popular types of ferneries are known as the “Bush-house,” the “Dug-out” and the “Under the trees.” To those who are fortunate enough to own a portion of a small gully, clothed with trees and furnished with a small stream or a spring, the establishment of a charming “Under the trees” fernery is a very simple matter. To those who are not so fortunate, there remains the choice of a “Bush-house” or a “Dug-out” fernery.

“THE “DUG-OUT” FERNERY.

It is believed that the “Dug-out” type of fernery was first evolved and constructed by Mrs. H. T. Lovell, of Hawera, Taranaki. This lady had observed that self-sown native ferns flourished on the clay sides of a disused well. Enlarging on this observation, Mrs. Lovell caused chambers to be excavated, in the volcanic clay hillside at her home, which were provided with a glassed roof similar to the simple sloping roof of a ‘lean-to’ glasshouse. Here it can be said that, before the excavating of the hillside was commenced, Mrs. Lovell visualised and plotted the finished fernery, arranging for terraces and banks, etc. to be left in the clay and sub-soil. Thus a minimum amount of spade work was necessary, and suitable positions were designed to suit the habits of the various species of ferns. The “shading” of the glass roof with thin white paint, to prevent scorching of the plants, the providing of suitable ventilation, and the connecting of a water supply completed the establishment of, what is believed to be, the first of the “Dug-out” ferneries. *Begonias*, *Gloxinias* and many other semi-delicate exotic plants flourish in this type of fernery, and a collection of the afore-mentioned plants in full bloom, against a background of massed ferns, is a sight not easily forgotten. The volcanic clay of Taranaki is peculiarly suited to the requirements of most New Zealand ferns. Except in very dry hot weather, very little regular watering is required, as the clay holds the moisture, and very quickly mosses over. Fern spores, carried by air currents and settling on the moist clay banks of the “Dug-out” fernery, quickly germinate and clothe the banks in Nature’s fashion. A particularly good type of “Dug-out” fernery is to be found at Pukekura Park, New Plymouth.

To those who are about to design a “Dug-out” fernery, the writer would advise against making the design of the interior too orthodox. Make the most of the space available and have nooks and

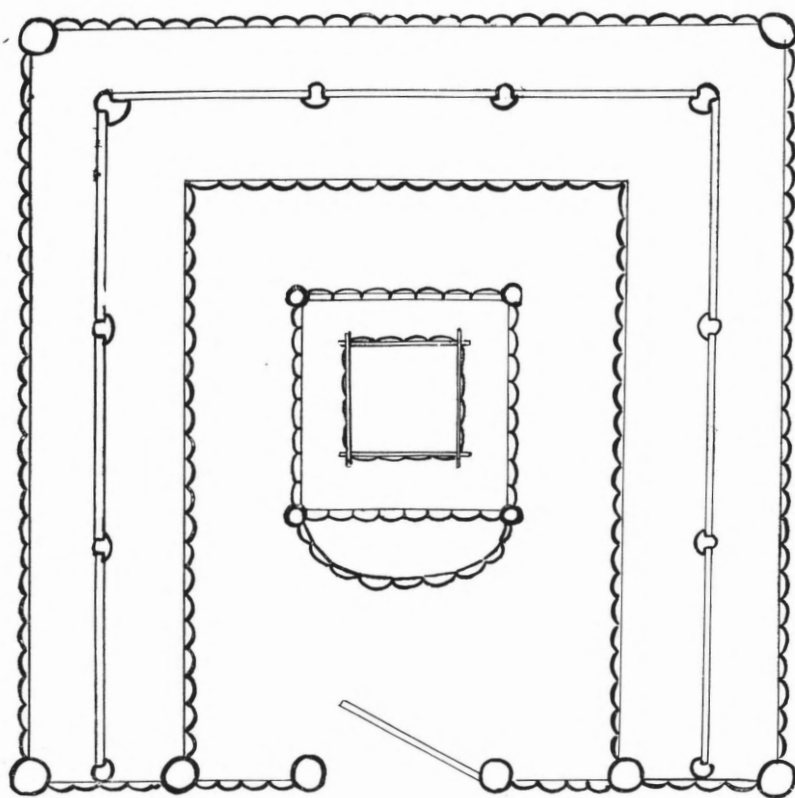
caves, etc., that one has to go round a corner to discover. Before commencing the excavating, draw a plan to scale, showing the details of the whole of the desired arrangement, including terracing, paths between raised clay banks, rock pool etc. It would be disappointing to discover, after the excavating is finished, that too much clay had been removed and that a desired bank or terrace had been lost. The writer would advise those, who are about to construct a fernery but have not had an opportunity to study our native ferns, to secure a good book dealing with all of the New Zealand species, their habits and natural habitat. This will be of help when plotting the fernery, as suitable positions adapted for growing the various species can be arranged for. A very helpful book in this connection is "New Zealand Ferns" by H. B. Dobbie.

When constructing a "Dug-out" fernery, the main excavating work should be completed before the glass roof is put into position. A sloping hillside or a bank offers the best site for a "Dug-out" fernery, but many have been excavated from flat land, and roofed over in similar fashion to the orthodox glasshouse. Ample drainage, of course, is necessary. Apart from the labour involved in excavating, the only cost of a "Dug-out" fernery is the glassed roof, the door, and the water piping.

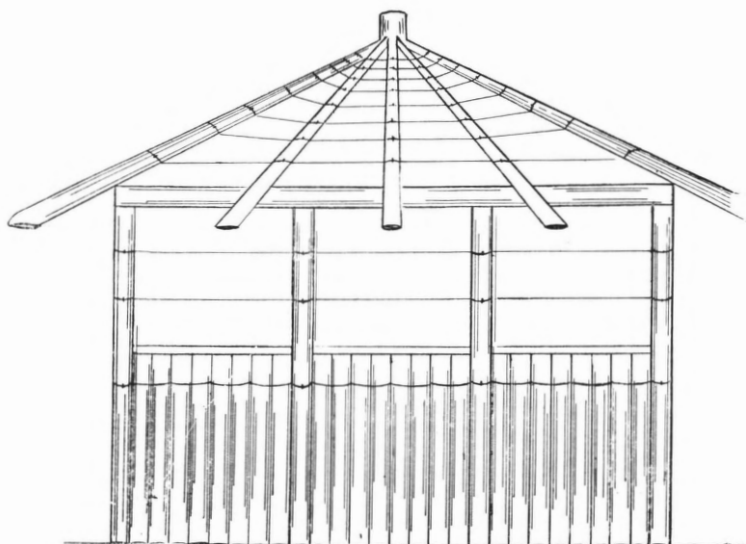
THE "BUSH-HOUSE FERNERY.

It is possible to erect a bush-house on even the smallest of town or city sections. To those who live in cities, the difficulty is sometimes experienced of obtaining suitable material for the structure. The fibrous trunks of tree ferns—*Pongas*—are ideal for the work, but the writer would be opposed to their use, if native bush is disfigured when they are obtained. When it is possible to obtain "Ponga" trunks from privately-owned bush, that is being cleared or thinned, no objection can be taken. This particularly applies, when bush is being judiciously thinned. New Plymouth district horticulturists have been particularly fortunate in being able to obtain suitable "Pongas" from the latter source. The fibrous trunks of *Dicksonia squarrosa*—*Wheki Ponga*—and *Cyathea medullaris*—*Mamaku*—are particularly suitable as material for bush houses. It should be emphasised that only that part of the Ponga trunk, that is actually composed of fibre, should be used. To use the top portion of a tree fern trunk is only a waste of time, as the non-fibrous portions rot very quickly. Other materials required for the "Ponga" bush-house are manuka or other brush, plain fencing wire, quarter inch round reinforcing iron, and some staples.

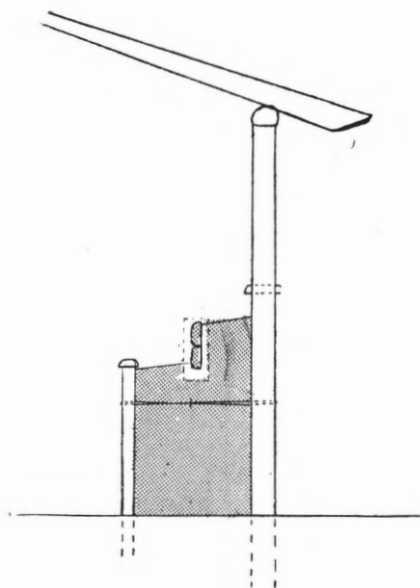
The accompanying plan and diagrams give details of a bush-house constructed of "Ponga" by the writer. For economic reasons most of the "Pongas" were sawn in half lengthways, as shown on the plan. The roof poles are of "Ponga" with plain fencing wire stapled on, and fashioned like a spider's web. The manuka brush for the roof, as well as the panels in the walls, is interlaced through the wire. The long posts supporting the roof should be sunk well in the ground. The half-pongas, forming the outside and inside walls, need not be more than six inches below ordinary ground level.



Plan of Bush-House Fernery (Roofing details omitted.)



Side Elevation—Bush-House Fernery.



Section cut through side and terracing

Support for the inside walls above ground level can be given, by double wiring the inner and the outer walls together at intervals, and "twitching" the wires in the centre to give the desired tension. The writer has found that, the most satisfactory way to spike ponga to ponga, is to use short lengths of quarter inch reinforcing iron as spikes, bending over the end, when most of the spike has been driven in. Earth is filled in, between the inner and outer walls and terraces can be formed, as shown on the plan and diagrams. The ponga-faced earth "banks" soon settle into a suitable well-drained habitat, suitable for most of our native ferns. The climbing ferns—*Polypodium* and *Lygodium*—readily ascend the ponga uprights. The manuka brush should only be dense enough to break up the rays of the sun. In fine, every endeavour should be made to obtain a "bush" atmosphere. Given this, the ferns will do well and the owner of such a bush-house will be well recompensed for his outlay and his labour.

HARDY HYBRID KOREAN CHRYSANTHEMUMS.

By Ben Wells, F.L.S.

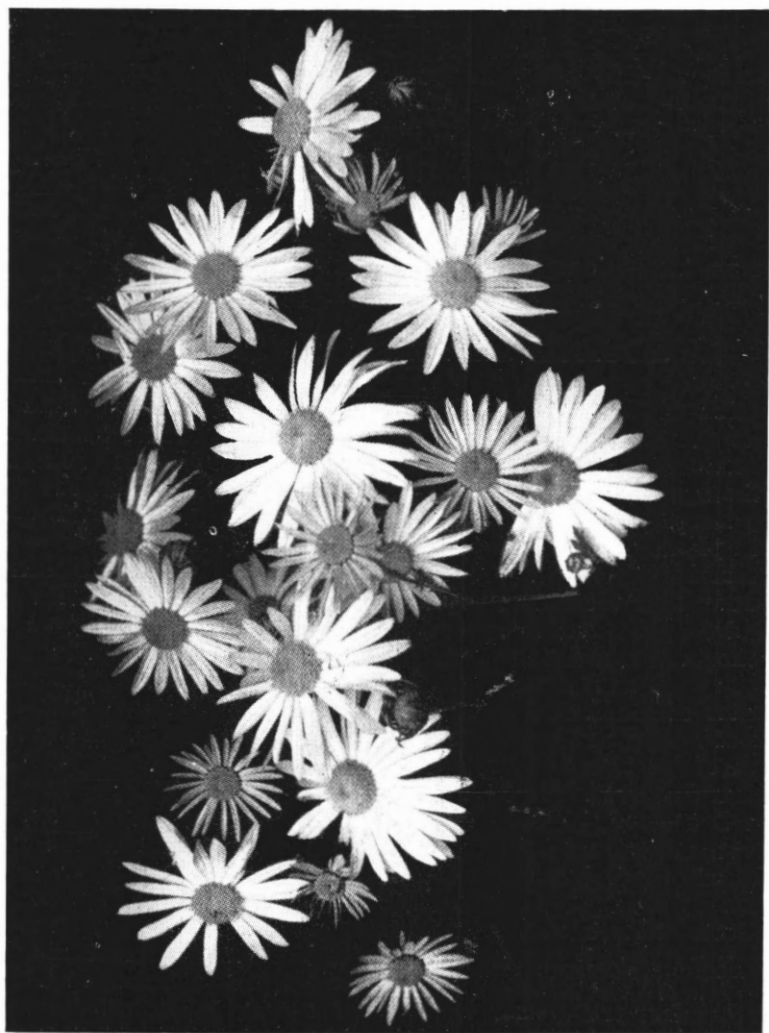
A new introduction among hardy border plants is always a matter of some importance and interest, and the appearance last year of the new Hardy Hybrid Korean Chrysanthemums is no exception to the rule.

Some fifteen years ago experiments were made in hybridising *Chrysanthemum coreanum*, a rugged, hardy species native to Korea and Siberia, with *C. indicum*—the prototype of many of our garden Chrysanthemums of to-day. Extraordinary and happy results were obtained, for the hybrid Koreans have inherited the hardiness and vigour of *C. coreanum*, making them hardy herbaceous perennial border plants in the true sense of the word.

Whilst the original crosses were made in America, some thirty varieties have now been tested in this country (England) and have been subjected to extreme weather tests for the past four years, and there is no doubt whatever that their hardiness in this country is proved beyond question.

They grow to a height of $2\frac{1}{2}$ to 3 feet and have an elegant branching habit which resembles that of *Aster Amellus*. They are sturdy and robust in growth, each plant producing dozens of flowers in heads 2 to $2\frac{1}{2}$ feet through in a single season. Their colourings are unusual—in fact they bear the shades of summer rather than those of autumn flowering plants. There are six named varieties, 'Apollo,' 'Ceres,' 'Daphne,' 'Diana,' 'Mars,' and 'Mercury,' which are available for planting this season, and their colours should satisfy all tastes, ranging as they do from yellow, golden bronze, pink through salmon to deep wine red.

The Korean hybrids flower from mid-September to well into November, with slight variation according to variety. The spreading bushy habit suggests their use in bold groups in borders, or in beds by themselves, or for massed effects.



[R.H.S. Journal]

KOREAN CHRYSANTHEMUMS

Planted in conjunction with other hardy herbaceous perennial autumn flowers, such as Michaelmas Daisies, Heleniums, etc., they will produce effective results, as well as lengthening the flowering season of the border.

As cut flowers there are few plants which can compare with them, for they will remain perfectly fresh for two weeks if cut and placed in vases.

They are not at all fastidious as to soil and situation—given a sunny spot in any ordinary well-prepared garden soil, they will flourish and well repay the time and labour spent in planting.

Experience has proved that no autumn herbaceous border is complete without its quota of outdoor Chrysanthemums, and while the older favourites will continue to find a place, the introduction of these Korean hybrids, owing to their hardiness, free-flowering propensity and ease of cultivation, will constitute a serious menace to the monopoly of popularity which the present outdoor Chrysanthemum has so long enjoyed.

NOTE:—Reprinted from the R.H.S. Journal, May, 1937.

GEORGE FREDERICK JAQUIERY.

The death of George Frederick Jaquiery removes from our midst one of the most active workers in the cause of horticulture and nature study. He died at Invercargill on September 10th, 1937 at the age of 53. Mr. Jaquiery was born at Wellington but spent the greater part of his life at Invercargill. He was deeply interested in plants both in the field and in the garden and, in his many excursions in the Otago and Southland districts, made himself familiar with the native vegetation. He was equally familiar with the birds, fishes and insects and so became the chief local authority on the flora and fauna of the southern portion of New Zealand.

Beyond Southland, Mr. Jaquiery was perhaps best known as Curator of the Southland Museum, which, largely due to his activities and enthusiasm, was built up to its present state. He devoted much of his time to research in the field, and, accompanied by Messrs. J. and H. Fowler, explored many little known parts of western Southland. He was interested in scenery preservation, and was an active member of the Forest and Bird Protection Society and of the Alpine Club. For several years he served on the executive of the Southland District Council of the New Zealand Institute of Horticulture, in the interests of which he was an ardent and earnest worker. At the Annual Meeting of the Institute, held in Wellington in March, 1937, he was elected an Honorary Fellow. Mr. Jaquiery was an extraordinarily versatile man and was regarded in his own district as an authority on all matters pertaining to horticulture and natural science. Frequently he was invited to give lectures on these subjects to various leagues, clubs, schools and kindred institutions.

As a memorial to him it is proposed to establish in Queen's Park, Invercargill, a garden to be known as the Jaquiery Native Plant Museum, in which it is hoped to grow as many kinds of native plants as possible.



GEORGE FREDERICK JAQUERY.

The following appreciation is extracted from the Southland Times of September 14th, 1937 and shows in what high esteem Mr. Jaquier was held in Invercargill:—

“George Jaquier will be greatly missed in Invercargill. The very great amount of help he gave in many directions will be best appreciated when it has ceased to be available. His extraordinarily profound knowledge of many subjects has for many years been at the free disposal of all seekers. People with all sorts of queries took them to him, and he was always ready to help or to direct to other sources.

In knowledge of the natural history of Southland he had no equal. He had explored its back country, studied its geology, and biology with very acute powers of observation, and a very retentive memory. He knew the occurrence of its plants, minerals, animals, and birds as nobody else has done. This information was always willingly imparted to all.

His untiring work as honorary curator of the Southland Museum has, in spite of lack of proper accommodation and little official help, built up a collection whose value is realised by outside scientists more than it is by ourselves. In fresh-water fish research the bulk of the scientific work was his, and the records have been worked up with the critical thoroughness which he brought to bear on all his interests. His enthusiasm for nature infected many of those who heard him and started many on the same path. His criticism of the power scheme in its early days, based as it was on his actual knowledge of the district, has been proved to be correct. His interesting and understanding reviews of books of travel and science have delighted readers of The Southland Times.

To many an overseas scientific visitor, most of whom came here with introductions to him, scientific knowledge in Southland is largely personified by George Jaquier. He it was who guided each in the direction in which he might best pursue his particular search. It will now be realised that Mr. Jaquier was a man whose death has taken away an immense amount of irreplaceable knowledge.”



LODER CUP COMPETITION, 1937.

The Loder Cup was presented by the late Gerald W. Loder (afterwards Lord Wakehurst), of Sussex, England, in the year 1926, to the lovers of nature in New Zealand as a challenge cup to be competed for annually in accordance with such conditions as might be approved by the Minister of Agriculture, in whose custody the Cup was placed. In this connection it is interesting to note that the present Lord Wakehurst, Governor of New South Wales, is keenly interested in the competition and has expressed his desire to keep up the family association with the Cup.

The Cup was formerly awarded annually to the winner of an open competition for New Zealand plants staged at specified Flower Shows, arranged alternatively under the auspices of the Horticultural Societies in the four centres. The competition was usually held at a National Flower Show in Horticultural Week.

The Cup was then awarded for the best collection of New Zealand plants grown by the exhibitor under bona fide garden conditions. The display could consist of either living specimens growing in pots or tubs, or portions of plants taken from living specimens grown by the exhibitor.

Competition in the foregoing form was continued over a number of years but a new Loder Cup Committee then decided that the intention of the donor of the Cup viz. "to encourage the protection and cultivation of the incomparable flora of the Dominion" could be better met by an alteration in the conditions governing the award and the Cup is now awarded annually to the person or body of persons, duly nominated, who or which, in the opinion of the Committee, has excelled all other nominees, in the year of the award, in furthering the aims and objects of the donor of the Cup. In arriving at its Award, the Committee works along the lines of the Nobel Peace Prize.

The Loder Cup Award for the year ended 30th November, 1937, has been made to the Auckland Institute and Museum, in association with the name of its Botanist, Miss Lucy M. Cranwell.

The Museum holds temporary exhibitions of native flowers, paintings and decorative designs based on our flora, and invites competitive displays from private persons, clubs and schools. The Native Flower Show, a memorial to the work of Mr. T. F. Cheeseman, which was first opened in 1932, and has been held annually since, attracted an attendance in September, 1937 of 10,449. These shows are not merely of local interest as keen competition exists between the country schools some of which are quite distant from Auckland.

The co-operation of the Auckland City Council, the local branch of the Institute of Horticulture and the Auckland Horticultural Society always has been sought and has been given with increasing enthusiasm,

Permanent displays illustrate the classification of the plant kingdom, plant nutrition, medicinal and other uses of plants by the Maoris. The Native Plant Table has been kept covered with fresh specimens of flowers, berries, etc., for seven years.

Eighty public lectures on native plants have been given by the Botanist since 1931. At three Arbor Day talks the attendance of children has been between 1,000 or 1,200 each year (Otahuhu, 1934, 1936, 1937). In addition, other members of the staff lecture regularly on Arbor Day.

Life-histories of native trees have been illustrated for the travelling school cases, and material for talks is lent freely to school teachers.

160 popular articles on native plants have been contributed by the Botanist to local papers and a few of these written in collaboration with Professor A. Wall have been printed in booklet form. Nine hundred of these have been sold in Auckland, mainly to secondary school children.

An energetic Scenery Preservation Committee has carried out consistently good work since its establishment in 1933.

Previous winners of the Cup have been:—

1934:—Lord Bledisloe.

1935:—Trustees of R. C. Bruce, Hunterville (in association with the name of Robert Cunningham Bruce).

1936:—J. Scott Thomson and G. Simpson (jointly), Dunedin.



SCHOOL OF HORTICULTURE.

On the suggestion of its Examining Board, a deputation, from the Institute's Executive, with representatives of its Canterbury District Council, waited upon the Prime Minister (Right Hon. M. J. Savage) on the 25th November last, to urge the establishment of a School of Horticulture at Christchurch.

The following were present:—

Messrs. F. S. Pope (President), H. Kitson (Chairman, Christchurch Domains Board), J. A. McPherson (Curator of Botanic Gardens, Christchurch), Professor H. B. Kirk (Chairman of Examining Board), W. S. LaTrobe (Member of Examining Board), J. A. Campbell (Director of Horticulture and Member of Examining Board), P. R. Parr (Honorary Secretary, Auckland District Council), W. Hyde (Member of Executive Council), C. H. Cuff, representing Masterton and G. S. Nicoll (Dominion Secretary). An apology was received from Mr. H. Baillie, a member of the Examining Board.

Mr. Pope appreciated the privilege of the interview and was encouraged by the Government's known interest in projects for the benefit of the people. The Institute was not a business concern but a voluntary body, whose aim was to focus and co-ordinate all kinds of efforts for the improvement of horticulture and the circumstances of persons engaged therein. Its membership was composed of amateurs, who gave of their time and money with no idea of gain, and of individuals and bodies, monetarily interested in horticulture, but supporting the Institute mainly from altruistic motives. For the past ten years, the Institute had been authorised by statute to conduct examinations in all branches of horticulture and to grant certificates and diplomas to successful candidates. At present there were over 80 registered students and the examination candidates for the past two years had been 26 and 22 respectively.

The Institute was recognised by the Royal Horticultural Society of England as the controlling authority in New Zealand in all horticultural matters and the Government, through the Department of Agriculture, granted it a small but greatly appreciated annual subsidy. Many bodies, interested in horticulture, including municipalities, are affiliated to the Institute and the Public Service Commissioner and most local-governing bodies take cognizance of its certificates and diplomas when filling positions requiring horticultural knowledge. It would thus be seen that the Institute was easily the most representative and responsible horticultural body in the Dominion. The economic importance of horticultural industries was referred to and the value of gardening to the community, more especially in view of increased leisure. The main object of the deputation was to request support for the establishment of a School of Horticulture in Christchurch or rather the development of the already established nucleus of such a school. Unanimous approval of this project was given by the last annual conference of the Institute. Christchurch has special claims to be chosen as the site of such a school as the fine

municipal gardens are close to the city with students already training. The request of the deputation was that the Government should approve of the development of such a School and should make a grant of £1500 for establishment purposes and an annual grant of £500 for 4 years towards working expenses. As the Dominion's annual horticultural week would be held in Christchurch towards the end of January and an address by a Minister of the Crown would certainly be sought for that occasion, would it not be specially fitting, if the Minister attending were to lay the foundation stone of the lecture room and library of the School of Horticulture made possible by the generosity of his Government?

Professor Kirk said that Christchurch was regarded as particularly suitable, notably on account of the great interest taken in this matter by municipal and other authorities, as well as the people, but because their gardens were readily accessible and the help of the University was assured. The University was also adjacent to Hagley Park and the Gardens, which would form one of the training grounds. He did not suggest that the Prime Minister should take one step forward; they hoped he would take the first step and would make a continuous advance as other towns of note would want to follow the lead of Christchurch. It was hoped that the Government would take the first step of a series in the establishment of a school of this kind. It was felt that, within the next few years, it would be found necessary to establish a University School of Horticulture.

Mr. H. Kitson had little to add to what he had said when the local branch of the Institute had met the Prime Minister at Christchurch. All the world to-day was looking towards youth which, owing to the war and unsettled conditions thereafter, had never had a fair chance. He was sure that every New Zealander would be glad to see that youth had its opportunity, which it had not had in respect of horticulture. To-day, no less than eighty registered students are prepared to take the full course and to conquer the art of horticulture. There was no need to worry as to what would happen to these students upon completion of the course, as there would always be openings for well trained gardeners. Kew Gardens had evidenced its satisfaction with the standard of the Institute's horticultural students by accepting several for further training. The suggested grant of £1500 only represented bare necessities but the money would not be spent in any unnecessary work.

Mr. J. A. McPherson stated that, during the past three years, inquiries regarding the school, from all over New Zealand, had totalled 86. Appropriate Government Departments would have full representation in the proposed scheme. Professors Hudson and Shelley, after full discussion, had agreed that the scheme was necessary and urgent. It was possible, under the scheme, to train a youth of the Native race annually and, after training, he could return and be of use to his own people.

Mr. McComb, M.P., stated that he had said all that was necessary at Christchurch, when he had advised the Prime Minister that the scheme appealed to him strongly. The horticultural interests at Christchurch had assured him that there would be no difficulty

in placing trainees. Increased leisure had resulted in increased business for seedsmen etc.

The Right Hon. the Prime Minister said he was entirely sympathetic towards the scheme. The representatives of the Institute of Horticulture had no occasion to apologise for its existence which was amply justified. Although the Minister of Agriculture regretted his unavoidable absence, he was favourable to the project. Although personally he did not see any reason why the scheme should not go ahead, it was a question as to whether the amount asked for could be made available and the final decision had to be made by Cabinet. Mr. McPherson mentioned the numerous boys who were anxious to undertake this work and the Government was anxious to see boys in work of this nature. In England he had met young New Zealanders, who, having reached a high educational standard in their country, were forced to go overseas for a living. This was wrong as New Zealand was a country which called for development. It might not be possible to put the matter before Cabinet at once but he would try and have this done as early as possible and would have the Institute advised of the position.



REPORT OF THE EXECUTIVE COUNCIL FOR THE YEAR ENDED 30th SEPTEMBER, 1937.

The Institute's fifteenth year still shows a record of steady progress in its activities and it is hoped that its membership will benefit through improved economic conditions.

EDUCATION:—The report of the Examining Board deals fully with this phase of the Institute's work. The Executive desires again to record its deep appreciation of the efficient and voluntary services rendered by the members of the Board and its examiners, in respect of the written and of the oral and practical examinations.

SCHOOL OF HORTICULTURE:—After a full perusal of and an interesting discussion on the preliminary report on the proposed School of Horticulture, prepared by the Curator of the Christchurch Botanic Gardens at Christchurch (Mr. J. A. McPherson), the Executive decided to endorse the scheme and to give its unqualified support thereto.

JOURNAL:—The Executive again extends its thanks to the Editor of the Journal (Dr. W. R. B. Oliver) and also to contributors for their valued assistance. In view of quarterly publication, an increase in contributions offered would be welcomed.

HONORARY BOTANIST:—The transfer of our Honorary Botanist, Dr. H. H. Allan, from Palmerston North to Wellington is welcomed by the Executive for personal reasons and easier access to his valued advice.

COCKAYNE GOLD MEDAL:—Mr. R. W. Balch, then employed at the Christchurch Botanic Gardens, was awarded the Cockayne Gold Medal, as the best student in the Diploma Examination for 1936, and he is now at the Royal Botanic Gardens, Kew.

NATIONAL CONFERENCE ON HORTICULTURE:—The eighth National Conference on Horticulture, which was to have been held at Christchurch from the 26th to the 28th January, 1937, was abandoned, at the request of the Director-General of Health, on account of the prevalence of infantile paralysis. The Institute's Conference was held at Wellington on the 11th March, following on the New Zealand Horticultural Trades' Association's Conference the previous day.

BANKS LECTURE:—The abandonment of the 1937 National Conference resulted in the loss of a most interesting Banks Lecture viz. "Horticultural Education in New Zealand" which was to have been delivered by Mr. L. W. McCaskill, M.Sc., who is a stalwart in this direction. The proposed lecture, however, was published in the Journal for March, 1937.

FOREST PRESERVATION:—At the Conference, 1937, our President, Mr. F. S. Pope, was appointed delegate to the Dominion Bush Preservation and Amenity Planting Conference, which was held on the 2nd. April last. He reported that this Conference was a great success in general and had been useful and well attended. A Committee, set up by the Executive, assisted materially in the revision of the draft of a proposed constitution for the National Organisation for Bush Conservation and Amenity Planting.

The Government is to be congratulated on the appointment of an Inspector of Scenic Reserves for each Island. The Institute made repeated representations for the appointment of such Inspectors.

CONGRATULATIONS have been extended to:—Dr. J. E. Holloway, Otago University, Dunedin, and formerly Chairman of the Otago District Council, on his election as a Fellow of the Royal Society; Mr. H. J. Poole, Lower Hutt, on the award of the Peter Barr Memorial Cup for outstanding work in conjunction with daffodils; Sir Algernon Thomas, Honorary Fellow of the Institute, on his well deserved knighthood. (Sir Algernon's death, since the close of the Institute's year, is deeply regretted).

CONDOLENCE:—The Institute has extended its sympathy to the relatives of E. Phillips Turner, Hamilton; Saul Solomon, Dunedin; G. F. Jaquier, Invercargill; J. G. Helyar, Lower Hutt.

Mr. E. Phillips Turner was a member of the Executive and of invaluable assistance in forestry matters. Mr. Saul Solomon, who was a keen horticulturist, was elected an Honorary Fellow in 1927. Mr. G. F. Jaquier, a member of the Southland District Council, was elected an Honorary Fellow at the 1937 Conference. Mr. J. G. Helyar was a valued member of the Institute who was keenly interested in the preservation and cultivation of our native flora.

FINANCE:—Capitation to District Councils has been increased from twenty to thirty per cent., but the alteration only operated from the 1st. April last. Although the excess of income over expenditure, for the period under review, amounted to £50/19/8, the Institute would find it difficult to carry on without the annual grant of £100 from the Government.



REPORT OF THE EXAMINING BOARD FOR THE YEAR ENDED 30th SEPTEMBER, 1937.

The major portion of the educational work of the Institute has now settled down to a regular routine but credit must be given to those who laid foundations secure enough to carry the present structure. Provision for approved gardens, standard circulars for students, regular submission of diaries with helpful comments, sympathetic employers and tactful examiners have all combined to make the examination scheme a success.

BOARD MEMBER:—Mr. J. A. McPherson of Christchurch was appointed to the Examining Board during the year.

APPOINTMENTS:—The Board has noted with gratification that Mr. A. White, N.D.H. (N.Z.) has been appointed Curator of Parks and Reserves at Nelson from Waimate and that Mr. G. A. R. Petrie, who passed the Intermediate Examination in 1936, has been appointed gardener to the Southland Hospital Board, Invercargill.

Mr. R. W. Balch, N.D.H. (N.Z.), Cockayne Gold Medallist, 1936, formerly of the Christchurch Botanic Gardens, recently left for the Royal Botanic Gardens, Kew and Mr. Noel Lothian, exchange trainee from the Melbourne City Gardens at the Christchurch Botanic Gardens, has returned to Melbourne en route to Kew.

FLORISTS AND SEEDSMEN:—It was decided to issue a further circular to apparently qualified Florists and Seedsmen who had omitted to make application for the Institute's National Certificates within the specified time.

THANKS:—The Board again records its thanks to Messrs. P. Black and W. Hyde and co-opted examiners for preparing the written tests and marking the examination papers, and also to all others who have assisted with the examination, including the examiners at centres for the Oral and Practical tests and also supervisors.

EXAMINATIONS:—The number of candidates for the November 1936 Examination, viz. 26, constituted a record. The following is a summary of the results:—

Examination.	Complete Pass.	Partial Pass.	Failure.
Junior	3	6	1
Intermediate	9	3	—
Diploma	3	1	—

CERTIFICATES ISSUED:—Appended is a list of Diplomas and Certificates issued, after examination, in addition to those shown in previous annual reports:—

Diploma in Horticulture	..	..	..	3
Intermediate Certificate in Horticulture	9
Junior Certificate in Horticulture	3

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List of Diplomas and Certificates granted under Section 4 of the New Zealand Institute of Horticulture Act, 1927, since the issue of the 1935-36 Annual Report:—

DIPLOMA IN HORTICULTURE.

Baleh, Robert Wilson; Christchurch.
Cuff, Charles Henry; Masterton.
Fleming, William Spencer; Auckland.

INTERMEDIATE CERTIFICATE IN HORTICULTURE.

Gilpin, Huia Gray; Christchurch.
Campbell, Eric Winston; Invercargill.
Huthnance, George Herbert; New Plymouth.
Lewis, John; New Plymouth.
Millson, George, Blenheim.
Mitchell, Llewellyn James; Timaru.
Petrie, George Alexander Ronald; Invercargill.
Thomas, Hector Percival; Invercargill.
Watters, William Smith; Auckland.

JUNIOR CERTIFICATE IN HORTICULTURE.

Hicks, George James; Christchurch.
Reston, David Pridham; New Plymouth.
Garrick, Keith; Christchurch.

TOTAL ISSUED TO DATE.

Diploma:	Without Examination	..	..	..	170
	Group C Examination	..	..	..	29
	Group B Examination	..	..	..	18
	Equivalent	..	..	..	1
Certificates:	Junior	32
	Intermediate	26
	Fruit-culture	1
	Florists	49
	Seedsmen	18

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EXAMINATION PAPERS, NOVEMBER, 1937.

JUNIOR EXAMINATION (Syllabus No. 1.)

HORTICULTURAL BOTANY.

(Time allowed—Three Hours).

Note.—SIX ONLY of the following questions are to be answered, including No. 8, which is compulsory.

Use diagrams to illustrate your answers when you can do so.

1. Describe the structure of any dicotyledonous seed, its mode of germination, and the young seedling.
2. Describe the process of either transpiration or respiration in green plants, and point out its significance for growth and development.
3. In what way are seeds adapted for dispersal by wind, and indicate their importance in horticulture.

4. Describe the main features of the Liliaceae, and name and describe any important garden member.
5. What is cambium? How are its properties made use of in horticulture?
6. Mention six different methods of pollination in plants; how is the knowledge of them useful in garden practice?
7. Discuss the assimilation of phosphorus compounds by plants.
8. Describe in technical language the botanical specimen supplied by the Supervisor.

JUNIOR EXAMINATION (Syllabus No. 1).

PRINCIPLES OF PLANT PROTECTION.

(Time allowed—Three Hours).

Note.—SIX ONLY of the following questions are to be answered.

Use diagrams to illustrate your answers when you can do so.

1. How would you control eelworm in glasshouse soils?
2. What is meant by the polysulphide content of lime sulphur?
3. Give the life history of a chewing and of a sucking insect, naming the insect in each case.
4. Outline the spray programme you would employ on peach trees.
5. Compare a powdery mildew with a downy mildew.
6. Detail one chemical process of seed disinfection.
7. Describe briefly the manner in which lead arsenate, nicotine and petroleum oil act as insecticides.
8. Show how plant hygiene assists disease control.

INTERMEDIATE EXAMINATION (Syllabus No. 2)

PRINCIPLES OF HORTICULTURE.

(Time allowed—Three Hours).

Note.—SIX ONLY of the following questions are to be answered.

1. What is meant by the biology of soils and how would you deal with two different problems arising under this heading in a lawn and in a potting soil?
2. The relation of heat, moisture, and air to the growth of plants under glass is of the greatest importance. Describe the requirements of any particular crop of this class and how they may be economically supplied in your locality.
3. Give a list of the various organic manures generally available; also describe their storage, preparation and use in horticulture.
4. Give a list of the phosphatic fertilisers in general use and the circumstances under which each may be used to best advantage.
5. What are the general principles underlying the propagation of plants by means of cuttings?
6. What are the best conditions for storing seeds? In what different ways may germination be accelerated when sowing them?
7. What are the general principles governing the pruning of deciduous trees and shrubs?
8. Name the kind and varieties of vegetable crops or fruit crops or ornamental trees and shrubs which are conspicuously successful when grown outside in a locality with which you are acquainted. Name the locality and describe the soil and climate.

INTERMEDIATE EXAMINATION (Syllabus No. 2).

PRACTICE OF HORTICULTURE.

(Time allowed—Three Hours, including Special Subject.)

Note.—THREE ONLY of the following questions are to be answered, also THREE ONLY of the questions on the Special Subject nominated.

1. Name and briefly describe the principal implements and tools used in gardening in your locality. What attention is required to keep them in good order?
2. Name the time of the year and describe the methods most suitable for breaking up rough grass land of a considerable area and for building up fertility for intensive cropping. Name the district and describe the land it is proposed to deal with.
3. Describe in detail what you consider to be the most convenient equipment for sterilising soil and other materials for the potting shed. Describe in detail also a mixture for raising seedlings, of some specified kind, in boxes.
4. Specify the details of a four-row shelter belt in an exposed position in your locality. When and how should it be planted?
What are the principal attentions required during the early stages of establishment?
5. Of the plants propagated by budding or grafting, select one kind and give details of these processes. Deal with the merits of the different stocks used and mention some of the best scion varieties.
6. What is the purpose and method of "summer pruning?" Describe this process as regards any kind of plant you may select.

INTERMEDIATE EXAMINATION (Syllabus No. 2).

Special Subject.—HORTICULTURAL ENTOMOLOGY IN RESPECT OF THE COMMONER INSECT PESTS PRESENT IN NEW ZEALAND.

(Time allowed—Three Hours, including "Practice of Horticulture.")

Note.—THREE ONLY of the following questions are to be answered, also THREE ONLY from the paper on "Practice of Horticulture."

1. Give the life history of a common moth or butterfly known to you.
2. Different kinds of insects have different kinds of mouth parts; illustrate this point by examples, and show what influence this has on the selection of a suitable spray for their control.
3. What do you know about eelworms? and what control methods would you adopt to control an infestation in bulbs?
4. Give the life history of the Grass Grub beetle.
5. Various kinds of garden plants have sometimes a black sooty appearance. Give the reasons: for this and state how you would deal with it.
6. What is a cutworm? Describe symptoms of presence and methods of control.

7. Apart from parasites, in what way are insects beneficial to horticulture? Illustrate your answer with examples.
8. Give the life history of a common aphid.

INTERMEDIATE EXAMINATION (Syllabus No. 2).

Special Subject.—GLASSHOUSE MANAGEMENT.

(Time allowed—Three Hours, including “Practice of Horticulture.”)

Note.—THREE ONLY of the following questions are to be answered, also THREE ONLY from the paper on “Practice of Horticulture.”

1. Give a detailed description of your method of growing a crop of Begonias (Tuberous) from seed to flowering stage—(a) in pots and (b) in open ground.
2. What are the principles of grafting the following under glass:—Clematis, Gypsophila and Rhododendrons with special reference to stocks, time of grafting and temperatures?
3. How are the Calceolarias (amplexicaulis), Violas and Pentstemons propagated from cuttings and held over the winter for spring planting?
4. Write a short essay on watering and syringing plants under glass.
5. For what purposes is electric heating desirable in glasshouses and how would you suggest that this be installed? Compare prices between electric and fuel heating.
6. Describe fully how palms are grown under glass and state the rate of increase, in number of leaves, to be expected per annum.

Note:—The same paper was used for the Diploma Examination without proviso as to the number of questions.

INTERMEDIATE EXAMINATION (Syllabus No. 2).

Special Subject.—THE FLOWER GARDEN IN ALL ITS ASPECTS.

(Time allowed—Three Hours, including “Practice of Horticulture.”)

Note.—THREE ONLY of the following questions are to be answered, also THREE ONLY from the paper on “Practice of Horticulture.”

1. Design, to scale, a moderate-sized bed of annuals for display in summer. Give details of the method and time of raising the plants, also the preparation of the land and planting out.
2. Draw to scale a plan of a herbaceous border, placing a number in each group indicated and attaching a list of the plants, each with a number to show its place on the plan. As far as possible, plants not requiring to be staked and tied should be chosen.
3. Write a short essay on the cultivation of one of the following:—Roses, dahlias, chrysanthemums or carnations. Name and describe some of the outstanding varieties.
4. What flowers for cutting may be grown outside during the win-

- ter in your district? Name the most suitable varieties or strain. Describe their preparation and packing for the market.
5. Give a selection of hydrangeas or rhododendrons that may be arranged to make a good display of blossom in the garden. Under what conditions and treatment will they give best results?
 6. Write a short essay on fragrant flowers for the garden.

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

(Time allowed—Three Hours).

Note.—SIX ONLY of the following questions are to be answered.

1. State the cost and give the names of the makers of the principal implements and tools used in gardening in your locality? What attention is required to keep them in good order.
2. Specify the equipment, fitting and operation for economically heating a glasshouse, making your own choice of the size and purpose of the house.
3. Specify and state the cost of the most suitable equipment for sterilising soil in situ; and also for soil to be used in preparation for potting or seed boxes.
4. Write a short account of common mistakes in glasshouse construction.
5. Give details of the time and method of propagating, by means of layering, of any class of plants you may select. What other kinds are best propagated by layering in your locality?
6. What is humus? Why is it an important factor in the fertility of the soil? What plants thrive well with little or none of it?
7. What percentage of the essential constituent is usually contained in each of the principal fertilisers? Under what conditions is each of these fertilisers used to best advantage?
8. Pruning is usually done to invigorate and direct the growth of a plant: or to encourage the formation of flowers and fruit. Give instances and details illustrating these statements.

DIPLOMA EXAMINATION (Syllabus No. 3).

Special Subject.—NURSERY MANAGEMENT.

(Time allowed—Three Hours).

1. Assuming that a consignment of assorted shrubs is to be sent overseas, describe your procedure from assembling to dispatch, including the necessary documents.
2. The following lines viz. Roses, Dahlias, Hedge plants and Tomatoes are being grown under glass. Give an outline with approximate dates of your several operations.
3. You have a crop of Tomatoes under a range of heated glass-houses. Make practical suggestions as to how you would arrive at the complete cost of production and what your profit on the crop would be.
4. You are required to supply cut flowers from May until August, with the aid of glasshouses. What subjects would you suggest? Give dates of starting and maturing of the several crops.

5. Describe your method of receiving and filing orders so as to cause the least amount of delay at the packing season.
6. Draw a plan of a nursery of three acres, with glasshouses, frames, packing shed, etc., designed for most economical working.

DIPLOMA EXAMINATION (Syllabus No. 3).

Special Subject.—TREES AND SHRUBS, TOGETHER WITH THEIR
PROPAGATION AND USE IN HORTICULTURE.

(Time allowed—Three Hours).

1. Give a list of ten shrubs, that could be propagated and grown successfully in a neutral or slightly acid soil, and ten that could be grown in an alkaline soil.
2. Write a short essay on the genus *Rhododendron* or *Crataegus*.
3. Show by diagram how you would plant a shelter belt, sixty feet wide (a) with exotic plants and (b) with New Zealand native plants.
4. Explain when and how you would transplant large specimens of (a) Evergreens and (b) Deciduous trees. Detail the treatment before and after planting.
5. Give the names of six eminent plant collectors, with brief notes about each.
6. Give a list of six conifers, suitable for rock work, and of six, suitable for lawn planting, with brief notes about each.



INSTITUTE NOTES.

EDUCATIONAL:—1937 Examinations: The following passes have been recorded:—Junior Certificate: Miss J. E. Denny and Mr. J. L. M. Tannock (Dunedin) and Mr. J. W. Goodwin (Christchurch). Intermediate Certificate: Messrs. D. C. MacKenzie and L. Treleaven (Christchurch), A. J. Silvester (Bulls) and A. F. Morgan (Timaru). Diploma: Messrs. F. J. E. Jollie (New Plymouth) and C. R. Nodder (Auckland).

PERSONAL:—It is pleasing to note that, Mrs. Knox Gilmer, Wellington and Mr. C. W. Corner, Superintendent of Reserves, Napier, both members of the Executive Council, have recently returned to New Zealand after interesting tours abroad.

Mr. J. A. McPherson, Canterbury Vice-President and Chairman of the local Council and Mr. P. R. Parr, Honorary Secretary of the Auckland District Council, were welcomed to the Executive's November meeting.

FLORIST AND SEEDSMEN'S CERTIFICATES:—In terms of the Scheme of Training and Examinations for each of these Certificates, candidates were required to make application not later than the 31st. July, 1936. Since then, however, certain inquiries indicate that there has been omission to make application within the period specified. A further circular has been issued and, should sufficient applications be received from qualified Florists and Seedsmen, it will probably be possible to further extend the date.

INTERNATIONAL HORTICULTURAL CONGRESS:—In intervals of from three to five years, International Congresses are organised, each time in another country. During the last Congress in Rome, 1935, it was decided to hold the next Congress at Berlin from 12th to 17th August, 1938.

BROADCASTING:—Congratulations have been conveyed to the Southland District Council on its having made arrangements with the National Broadcasting Service for regular weekly broadcasts on topics of horticultural interest.

CONDOLENCE has been conveyed to the wife of W. V. Kingsbeer, Palmerston North, who was one of our most popular members and always keenly interested in the Institute's activities, having been its first Treasurer.

Statement of Receipts and Payments for year ended 30th September, 1937.

RECEIPTS.				PAYMENTS								
	£	s.	d.	£	s.	d.	£	s.	d.			
To Post Office Savings Bank ..	237	6	8				By Salary Dominion Secretary ..	140	4	7		
„ Bank of New Zealand ..	72	11	0				„ Capitation Fees (District Councils)					
				309	17	8	Auckland	10	0	1		
„ Subscriptions—							Taranaki	3	0	6		
Individual Current ..	105	1	3				Canterbury	4	4	6		
„ Arrears ..	21	4	0				Otago	3	3	0		
				126	5	3	Southland	4	4	0		
Affil. Societies Current ..	36	15	0					24	12	10		
„ „ Arrears ..	10	6					„ Conference Printing ..	4	13	8		
				37	5	6	Sundries	1	14	9		
„ Examination Fees				58	16	0			6	8	5	
„ Exchange				16	3		„ Publications—Journal ..			53	13	6
„ National Flower Show, Dun-							„ National Flower Show, 1937 ..			5	0	0
din				2	7	3	„ Examination Expenses ..			1	18	2
„ Publications				19	0		„ Cockayne Gold Medal ..			1	7	6
„ Refund of Library Grant,							„ Office Expenses—					
Auckland				1	1	0	Cleaning			5	19	0
„ Government Grant				100	0	0	Exchange			1	12	3
„ Post Office Savings Bank							Postages			19	8	2
Interest				12	14	10	Printing & Stationery ..			13	7	9
„ Debit Balance Bank of New							Rent and Light			30	16	8
Zealand				4	16	7	Sundries			10	9	0
									81	12	10	
							„ Post Office Savings Bank ..			340	1	6
				£654	19	4				£654	19	4

Income and Expenditure Account for year ended 30th September, 1937.

	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.
To Conference Expenses	6	8	5									
„ Advance National Show, 1937	5	0	0									
	<hr/>			11	8	5						
„ Capitation Fees—												
Auckland	10	0	1									
Taranaki	3	0	6									
Canterbury	4	4	6									
Otago	3	3	0									
Southland	4	4	9									
	<hr/>			24	12	10						
„ Dominion Secretary's Salary				140	4	7						
„ Publications				55	3	4						
„ Depreciation				8	0	0						
„ Cockayne Memorial Medal ..				1	7	6						
„ Examination Expenses ..				1	18	2						
„ Office Expenses—												
Rent and Light	30	16	8									
Cleaning	5	19	0									
Printing & Stationery ..	13	7	9									
Postages	19	8	2									
Exchange		16	0									
Bank Charges	1	2	2									
Insurance	1	6	8									
Repairs to Typewriter ..	2	7	6									
Sundries	4	19	4									
	<hr/>			80	3	3						
	<hr/>			50	19	8						
Excess of Income over Expenditure												
	<hr/>			£373	17	9						

	£	s.	d.	£	s.	d.	£	s.	d.
By Subscriptions:									
Individual Current	134	13	3						
Arrears	21	4	0						
	<hr/>			155	17	3			
Affil. Fees Current	41	18	0						
„ „ Arrears	10	6							
	<hr/>			42	8	6			
	<hr/>			198	5	9			
„ Examination Fees				63	0	0			
„ Refund of Library									
Grant, Auckland							1	1	0
„ Government Grant							100	0	0
„ National Show Dunedin							2	7	3
„ Interest Post Office Savings									
Bank							9	3	9
	<hr/>						£373	17	9

Balance Sheet as at 30th September, 1937.

[illegible]

I have examined the books, papers and vouchers of the Institute and certify that in my opinion the above Balance-sheet correctly shows the position, as at the 30th September, 1937, and the accompanying Receipts and Payments and Income and Expenditure Accounts the transactions for the year ended that date, as shown by the books.

(Sgd.) J. L. ARCUS, F.I.A.N.Z.

Wellington, 17th December, 1937.

(Sgd.) J. L. ARCUS, F.I.A.N.Z.

Hon. Auditor.

NEW ZEALAND INSTITUTE OF
HORTICULTURE
(INCORPORATED.)

Patrons: Their Excellencies VISCOUNT GALWAY, Governor-General
and LADY GALWAY.

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

President: F. S. POPE, Esq., Wellington.

Hon. Editor: Dr. W. R. B. OLIVER, Dominion Museum, Wellington.

Dominion Secretary: G. S. NICOLL, P.O. Box 1237, Wellington

Hon. Secretaries of Local District Councils:

Auckland: P. R. Parr, 7 Atarangi Road, Green Lane.

Canterbury: J. N. McLeod, 108 Paparoa Street, Papanui, Chch.

Otago: Dennis H. Leigh, Botanic Gardens, Dunedin,

Southland: B. P. Mansfield, Box 51, Invercargill.

Taranaki: J. O. McDowall, B.Sc., Vivian Street West, New Plymouth.

Membership:

Individuals: 12/6 per annum (including Member's wife).

Juniors under age eighteen: 2/6 per annum.

Societies, Firms, etc., 21/- per annum.

Journal (quarterly):

To Members: Free.

Examinations:

Examinations are held yearly in November.

Students desiring examination should make early application to

DOMINION SECRETARY,

N.Z. Institute of Horticulture,

P.O. Box 1237, Wellington.