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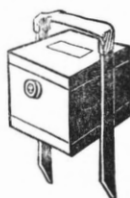
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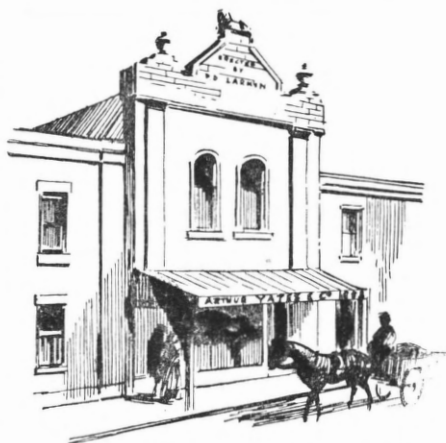
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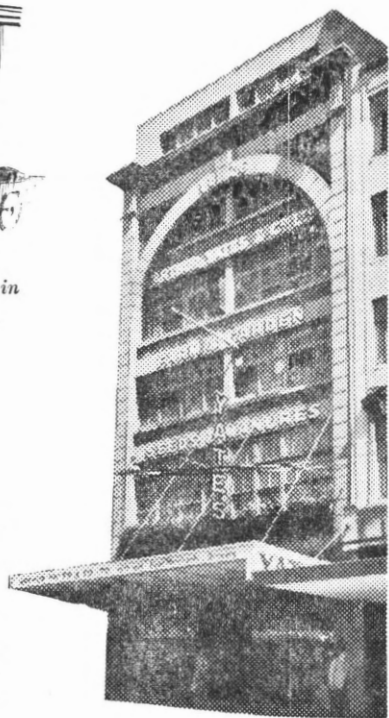
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# NEW ZEALAND PLANTS AND GARDENS

The Official Journal of the Royal New  
Zealand Institute of Horticulture (Inc.)

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## PLANT NAMES

It is natural that charm and beauty should evoke a feeling and a desire for poetical expression. That is why flowers have ever provided inspiration for the greatest poets who, naturally, find Gillyflower more suitable for fitting in to a poetical metre than any of its botanical equivalents — *Dianthus caryophyllus*, *Galanthus nivalis*, *Matthiola incana* or *Cheiranthus cheiri*. I can quite sympathise with their point of view. One can quite understand, too, that simple country folk gave their own names, and very descriptive names, to the flowers of their particular countryside. The Maori people have their own names for the native plants of New Zealand that come "trippingly on the tongue." None of these instances can fairly be criticised.

The position is quite different, however, when, for commercial reasons or in order to make a plant "popular," a name is coined that is nothing short of misleading. I have in mind the use of White Forsythia for *Abeliophyllum distichum*, Californian Lilac for *ceanothus* species, Apple Blossom for *diervilla*, which may more legitimately be used for the *malus* family. Through common usage over a period of many years syringa (lilac) has been used for what is rightly *philadelphus* and nasturtium (watercress) for *Tropaeolum majus*. I heard one well-known horticulturalist say, some years ago "I hear of a plant called Baby's Breath, but no-one can tell me whether this very charming expression refers to the appearance of the flower or its smell."

In gardening books we read of the Chinese Mountain Azalea. There are a number of species of azalea (now rhododendron) to be found in the mountains of China so it is difficult to know to which species this could refer. The same may be said concerning the Chinese Barberry, the Carpathian Harebell and the Japanese Azalea. It has always impressed me as being singularly inappropriate that we, in New Zealand, should speak of Michaelmas Daisies. Michaelmas Day, in England, falls on 29th September and at that time the asters of the *novae-angliae* and *novi-belgi* groups are at their zenith. In the Southern Hemisphere they flower in February and March. Surely Perennial Aster would be more in keeping.

English or, indeed, any other common name for plants cannot be considered professionally in horticulture except for varieties of garden origin. Latin or Greek names in accordance with the Linnaean system

and adjusted from time to time by the various plant nomenclature conferences, provide an international means of identification. Strawberry Tree may suggest one of two genera to some gardeners but the names *Arbutus unedo* and *Cornus capitata* differentiate between them, dispel confusion and are clear means of identification to horticulturalists of all nations.

It should be the aim of all serious horticulturalists to do all they can to encourage the use of proper botanical names. By so doing they will bring order to the profession, and the growers and retailers will escape many headaches.

G. A. R. PHILLIPS,

Editor.

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### SOME INTERESTING MELALEUCAS

W. R. STEVENS (*Wanganui*)

For many years melaleucas have exercised a fascination for me and I have assiduously planted every species that was available. I almost became a fanatic in the effort. Despite all my efforts, I have, at this date only about 30 species growing, and when it is remembered that there are over 100 recognised species it is obvious that I have a long way to go to satisfy my craving.

The attraction this genus has for me is probably bound up in the diversity of form and colour, and in most cases, the adaptability of its members to my soil. Also, they vary in height so much that I am able to place them to conform with any part of my garden. They may only grow up to 3 feet, which makes them excellent front line shrubs, or they may grow up to 30 feet and make an ideal background. Again, the time of flowering is so varied that it is easily possible to have one or more species in flower every week of the year. To add to this, the flowers have a wide range of colour, ranging from white, cream and yellow to pink, lavender, purple and red.

The genus is closely allied to *Callistemon*, but is distinguished from it by its five bundles of stamens united by the filaments. To the average gardener this may not seem much of a difference, but to the botanist it is a very significant feature.

Melaleucas are almost entirely confined to Australia, and over three quarters of them occur in Western Australia. The soil conditions in which they grow naturally vary considerably and while some species occur in moist, peaty soils, others favour dry hungry soils with low rainfall. We, as gardeners, are inclined to ignore all these local conditions and expect all the species to grow and flourish in our own particular soil. Naturally some of them refuse and it is then up to the gardener to modify conditions to suit what we would term the difficult ones.

The general method of propagation is by seed, which, if it is fresh, germinates very quickly. Very often the seed capsules persist for years on the older parts of the plants, but once the seed is released from the



capsule it does not seem to be viable for very long. However, some species do not set seed at all freely and to get plants of these the gardener must propagate them by means of cuttings. When specimens are already growing in New Zealand this is quite a simple matter, but in the case where the species has not already been introduced it is necessary to get cuttings from Australia.

Some years ago, when on a trip to Australia, I brought back cuttings of five species new to me, and plants of these are now well established. They have flowered for several years but so far show no signs of setting seed.

One of these was *Melaleuca violacea*, a most attractive small shrub for a summer display, and a mature plant would be about 4 feet high and as much across. The light violet flowers are very freely borne on the terminals of the previous year's growth and it continues to flower for about a month. As a rule it does not have a central leader but divides and splays outward, allowing all flowers to face the sun. The individual flowers are small but make up for this by a massed effect almost hiding every leaf. Unfortunately they do not keep when cut and this is a fault rare with this genus. One important point about the culture of *M. violacea* is that it requires, or rather, demands a loose soil with sharp drainage.

*M. nesophila* is a vigorous growing species up to 10 or 12 feet and branching fairly widely. The dainty lavender flowers are about  $\frac{3}{4}$  in. in diameter, almost globular, and are borne terminally on short growths. The flowering period extends over several weeks, starting in January and I have had blooms up till May. This is one of the few shrub flowers of mid-summer that keep well when cut and a bowl of them, even in the hottest weather is a positive delight. The plant stands pruning well, even severe pruning, and young growth will start from heavy wood no matter when it is pruned. It does not appear to be at all fussy about its soil, as I have seen it doing equally well in light and heavy soils. Altogether a most satisfactory shrub worthy of wider cultivation. In nature it is confined to Western Australia.

*M. erubescens* is a small growing shrub of about 4 feet with closely set erica-like leaves about an inch long. The dainty orchid pink flower spikes resemble miniature bottlebrushes and are borne several inches down from the ends of the growths. It is quite a vigorous shrub with rather slender, upright growth and will stand long periods of dry weather without suffering in the slightest. It is a native of Queensland and New South Wales where it occurs in light soils, but here it seems quite happy in heavy soil.

*M. suberosa* is in appearance totally different from all its relatives and when not in flower most people would not see any resemblance to the genus. It is from a low rainfall area in Western Australia and has provided against transpiration by two very marked features. First, the leaves are very small and clasping, almost ericoid and occur mostly in the centre of the plant. Second, the bark is rough and corrugated and almost cork-like. In fact it is from this resemblance to cork that the

plant gets its specific name. In parenthesis, I could wish all specific names of plants referred to some dominant characteristic. This would be really helpful to the gardener when trying to determine whether his plant is under the right label. The growth of *M. suberosa* is not terribly attractive, as it grows outward rather than upward and eventually forms a straggling shrub up to 2 feet high and 6 feet across. The numerous leaders grow upright for a foot or so and then gradually bend toward the soil. In early September the first hint of flowers appear as a faint pinkish glow on the bare angular stems and on close examination there can be seen hundreds of tiny flower buds protruding from the corky bark. In time these minute buds erupt bundles of stamens until the whole of the stem is covered with small lolly-pink flowers. Strangely enough the flowers appear first on the underside of the stems, gradually encircling them until the effect is almost as if pink cotton wool had been tied around them. One more feature makes this plant distinct, and that is that the flowers are perfumed. And not lightly either, for within a range of several yards one suddenly becomes conscious of an intriguing spiciness resembling cinnamon. My limited knowledge does not permit me to dogmatize, but as far as my acquaintance with melaleucas goes I do not know of any other species with perfumed flowers. Altogether it is a fascinating and interesting plant that I am glad to have grown. The surprising part to me is that a plant from such a low rainfall area and high temperatures will not only consent to grow in my conditions, but also gives the impression of being perfectly happy. This should teach us a lesson — that we, as gardeners, should not presume to judge a plant's capabilities purely from its habitat.

A very different plant is *M. linariifolia*, which occurs in the swamps or ill-drained areas of the New South Wales coast. This makes a large shrub or small tree up to 20 feet and has light green leaves about an inch long. These leaves are quite aromatic when bruised, giving off a perfume reminiscent of Lemon Verbena. The flower spikes are light and dainty, composed of countless bundles of lacy white stamens, and the whole effect is graceful and airy. For table decoration the flowers are ideal, either by themselves or with other flowers, and keep well when cut. It belongs to the "paperbark" section and flowers in summer. Although it is naturally tall growing it can be kept down by pruning and is very easy to grow in most soils provided that it does not suffer from drought in summer.

Another easy species to grow is *M. microphylla* from Western Australia. It forms a graceful shrub up to 12 feet and while upright in habit, the branches are slender and semi-weeping. The specific name is well chosen, the leaves being indeed small, barely more than  $\frac{1}{2}$  inch in length and linear in form. The flowers are shaped like a small bottle-brush, about  $1\frac{1}{2}$  inches long and barely an inch in diameter. They are a soft lime green in colour and are borne terminally on short lateral growths. It is a most profuse flowerer, starting generally about the end of September and continuing until the middle of November. A vigorous growing species which does not seem to object to any type of soil, and



while it could not be classed as one of the aristocrats, it nevertheless adds an attractive and distinctive note to the garden. Propagation is easy, as it has the habit of throwing up numerous root suckers which can be transplanted without difficulty. The flowers are ideal for indoor decoration and keep well when cut.

*M. macronycha*, formerly named *longicoma*, is another species from Western Australia, and any gardener seeing this in flower for the first time would undoubtedly pronounce it a callistemon, which it certainly resembles. However, the botanists say it is a melaleuca and we must accept their dictum. Whatever its genus, it still remains a striking plant when in flower. The spikes are about  $2\frac{1}{2}$  inches long and rather broader than the usual bottlebrush. In fact it has what I would term a fat look owing to its short length. The bright red stamens are set off by brilliant orange-yellow anthers, giving an iridescent look to the whole flower. While not a difficult plant to grow I would not say it is really happy in my heavy soil and I would like to see it tried in much lighter soil. After all, optimum growth is just a matter of comparison — we may think we have optimum growth until we see someone else growing a plant ever so much better.

In a short article like this it is impossible to do more than touch the fringe of such a large genus and the few species that I have described can only serve as a taster to those who may become further interested. The question of hardiness is one that I am unable to answer, as it is very uncommon to get more than 5 degrees of frost in this garden.

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## HORTICULTURAL DISCARDS MAY BECOME NATIONAL WEEDS

[Text of a paper presented to the Annual Meeting, Canterbury District Council of the Royal New Zealand Institute of Horticulture (Inc.)]

A. J. HEALY (Christchurch)

Little do many gardeners think as they proudly survey their gardens that some of those choice plants on which they lavish loving care may be "wolves in sheep's clothing." You may think this is an impossible statement, and that I have a jaundiced view on matters horticultural.

In this short paper I propose to present irrefutable evidence that the title of the paper can be very true, and that over the years, both in New Zealand and overseas, the weed problem has been augmented and aggravated by gratis contributions from horticulture, in addition to those from agriculture and forestry.

It was estimated in 1940 by Dr. H. H. Allan (then Director, Botany Division, D.S.I.R.) that about 25 per cent. or one quarter of the adventive flora of New Zealand owed its origin to horticultural activities, which in terms of species then meant about 300. I would venture the opinion that the proportion is greater at the present time.

In thinking of weeds, many people confine their conception to such spectacular and major ones as Gorse, Broom and Ragwort which are so evident in the countryside, and to those which immediately concern them in tending their lawns and gardens — Twitch, Dandelion, Sorrel and daisies, etc. The term "adventive" covers all the plants known as weeds, and as well all plants which grow spontaneously, i.e. not in a state of cultivation. Such adventive plants make up the adventive flora.

Thus, while a plant grows happily under cultivation within a garden it is a member of the cultivated flora, but as soon as it strays from cultivation into the adjacent vacant section, drain or roadside, or even takes charge of the garden itself, it has moved into the adventive flora, meriting in many instances the disapproving rather than the fond glance.

Horticultural activities in New Zealand can be regarded as commencing in 1773 when Captain James Cook sowed vegetable seeds at Queen Charlotte Sound (G. M. Thomson, *Naturalisation of Animals and Plants in New Zealand*, 1922, p. 6).

With the advent of the missionaries and settlement, horticultural activity can be said to have begun in earnest. Chas. Darwin in his Journal entry for 21st December, 1835 notes that "At Pahia, it was quite pleasing to behold the English flowers in the platforms before the houses; there were roses of several kinds, honeysuckle, jasmine, stocks, and whole hedges of sweet briar." Further, in talking of Waimate North he says. ". . . . there were large gardens with every fruit which England produces; and many belonging to a warmer clime. I may instance asparagus, kidney beans, cucumbers, rhubarb, apples, pears, figs, peaches, apricots, grapes, olives, gooseberries, currants, hops, gorse for fences, and English oaks; also many different kinds of flowers."

Thirty-two years later, J. D. Hooker (*Handbook of the New Zealand Flora*, part II, 1867, pp. 758-63) was able to record amongst the species in his list of adventive plants the following:—

<i>Ulex europaeus</i> (Gorse)	<i>Petroselinum sativum</i> (Parsley)
<i>Rubus</i> sp. (Blackberry)	<i>Daucus carota</i> (Carrot)
<i>Rosa micrantha</i>	<i>Pastinaca sativa</i> (Parsnip)
<i>R. rubiginosa</i> (Sweet Briar)	<i>Sambucus nigra</i> (Elderberry)
<i>R. canina</i> (Dog Rose)	<i>Physalis peruviana</i>
<i>Oenothera stricta</i>	(Cape Gooseberry)
(Evening Primrose)	<i>Lycium chinense</i>
<i>Opuntia vulgaris</i> (Prickly Pear)	<i>Digitalis purpurea</i> (Foxglove).

Thus it can be seen that the beginnings of the adventive (including the weed flora) flora were built up in part from contributions from horticulture. So down the years from 1867 to the present time an increasing number of horticultural species have escaped from cultivation and grow spontaneously in districts throughout New Zealand.



You may well ask how do these plants stray from cultivation, the answer being that the ways are numerous, the following worthy of mention:—

- (a) Plants become aggressive in the garden, are rooted out and dropped over a river bank or into other waste land during the Sunday afternoon pleasure drive. They establish at the point of deposition and spread afield from there.
- (b) The seeds or fruits of some plants are readily dispersed from a garden by wind into adjacent vacant sections, roadsides or farming land e.g. *Araujia sericifera* (moth-catching plant or kapok-vine); *Aster* spp. (Michaelmas daisies), so common in footpath cracks about Christchurch.
- (c) Succulent fruits are readily eaten by birds, the seeds being dropped in the dung on adjacent land, e.g. species of berberis and cotoneaster.
- (d) Gardens are abandoned and plants therein run riot and spread to adjacent land.
- (e) Bulbs, corms, rhizomes, fruits and seeds are dispersed in earth round roots of plants exchanged between friends or sold commercially.
- (f) Aquatic plants grown in ponds, aquaria, etc., are dispersed into drains and creeks through overflow pipes, or plants become aggressive and are tossed out into drains or creeks in which they establish and spread.
- (g) The introduction of new species and new strains of existing species used horticulturally tends to make the normally used plants obsolete, these sometimes being disposed of in such a fashion that they can establish and spread outside of gardens. It seems that there are fashions in horticulture as well as in ladies' hats.
- (h) The prevalent practice of discarding unwanted bulbs and corms on the nearest roadside or over the fence into the next unoccupied section is indicated by the establishment of these horticultural discards or outcasts in the situations mentioned.

It may be said, and with justification, that some, at least, of these garden escapes or outcasts are colourful, even spectacular, and not troublesome as for example *eschscholtzia* on the shingly riverbeds of Canterbury, but it can be said, with equal justification that other such escapes and outcasts are of considerable economic significance owing to noxious characteristics.

I wonder how many gardeners found significance in the special statement issued by the Hon. the Minister of Agriculture (Mr. K. J. Holyoake) on 1st March, 1955, to the effect that it was proposed to set up a special mobile gang for the control of certain weeds, those named being *Eichhornia crassipes* (Water Hyacinth), *Pennisetum macrourum*, *Homeria breyniana* (Cape Tulip) and *Centaurea repens* (Russian Thistle). Was it appreciated that the first three of the four weeds specified owed their origin in New Zealand to horticultural activity?

A few examples of important garden escapes and the reasons why they are proving significant, will give some conception of just what horticulture's contribution to the weed flora means:—

1. Poisonous to livestock:

*Conium maculatum* (Hemlock)

*Cestrum* spp.

*Homeria breyniana* (Cape Tulip)

*Hypericum androsaemum* (Tutsan—miscalled St. John's Wort)

*H. calycinum* (Aaron's Beard or Rose of Sharon)

*Melianthus major* (Cape Honeyflower—miscalled Castor Oil Plant)

*Ricinus communis* (Castor Oil Plant)

*Solanum dulcamara* (Bitter Sweet)

2. Blocking drains and waterways:

*Aponogeton distachyus* (Cape Pond Weed)

*Eichhornia crassipes* (Water Hyacinth)

3. Bulbous plants of gardens and roadsides:

*Allium triquetrum* (triquetrous Leek)

*Crocasmia x crocosmiiflora* (Montbretia)

*Gladiolus cuspidatus*

*Oxalis* spp. (oxalis; Shamrock).

*Watsonia* spp.

4. Aggressive in pasture:

*Homeria breyniana* (Cape Tulip)

*Erica* spp. (heaths)

*Pennisetum macrourum*

5. Tainting of dairy produce:

*Allium* spp. (wild onions and leeks)

On the evidence submitted earlier in this account I think it must be agreed that real danger both to the individual and to the nation can and does exist in gardens and awaits only a favourable opportunity to become significant.

The existence of such a danger indicates surely that the horticulturist, using the term in its broadest sense, has, in addition to the privilege of cultivating and enjoying the different plants of his choice, a very clear accompanying responsibility towards his neighbour. This responsibility is to guard against the escape and spread of horticultural subjects from the confines of cultivation: in other words to prevent horticultural plants becoming members of the adventive and weed floras.

A clear responsibility has been mentioned — I wonder whether it is really clear to horticulturalists and whether it is really accepted? There are several distinct facets which merit consideration in detail, considering the stakes that are involved.

### Distribution of Horticultural Subjects

When a plant, however choice and beautiful it might seem, shows some character which you think could be troublesome, or which proves aggressive in your garden do *not* distribute it to neighbours and distant friends. You may be commencing the chain reaction which ends in a national expenditure of untold thousands of pounds for control alone, not eradication, of the plant. The history of *Eichhornia crassipes* (Water Hyacinth) in New Zealand and overseas illustrates this point.

Similarly, even though you may not distribute a plant intentionally, take care that pieces of root, bulb, tubers, seeds or seedlings are not accidentally spread in the earth round roots of other plants which are given away or sold. *Nassella trichotoma* (nassella tussock), an undesirable South American grass established in North Canterbury and Marlborough was transported from one locality to another as seedlings in dirt about the roots of strawberry plants. Think also of the many gardeners who rue the day they introduced oxalis spp. into their gardens in soil about the roots of gifted or purchased plants.

### Disposal of Unwanted Plants

When plants have to be disposed of either because they have been superseded by new or improved strains, or because they have proved aggressive in the garden do NOT—

- (a) throw them in the adjacent vacant section.
- or (b) throw them into the nearby drain or creek
- or (c) throw them on to the roadside
- or (d) take them into the country and throw them into the abandoned shingle pit, on to the riverbed, on to the roadside, or over the side of the road embankment.

### Intelligent Observation

When it is observed by the horticulturalist that the same plant or plants that he is cultivating in his garden is spreading in adjacent paddocks and has the appearance of being a weed, it is surely time that he asked himself the question "Shouldn't I take some action about this?" and get in touch with both his neighbour and the appropriate authorities. The lack of intelligent observation, accompanied by a policy of "wait and see, it can't be serious" has cost New Zealand thousands of pounds, taking *Homeria breyniana* (Cape Tulip) as a single example.

### Extra-garden Planting

The beautification of cemeteries is a laudable object, but it is unfortunate that as commonly practised in New Zealand, it becomes a source for weedy plants to spread out into adjacent farming land. Plants which prove permanent in cemeteries are mostly those species which tolerate lack of attention and unfavourable habitat conditions, these being unfortunately the characteristics of species which prove successful and troublesome weeds. How many horticulturalists have

ever considered that many of the major infestations of *Erica* spp. (heaths) amounting to many thousands of acres had their origin from plantings of cemeteries? This can be taken as a plea for more careful consideration when making plantings in cemeteries, and for more practical and permanent arrangements for upkeep of cemeteries by the authorities who control them.

Further, I would suggest that very careful consideration should be given before plantings of exotic species are made in and about reserves of native plants and native forests. Such haphazard plantings about many such reserves in New Zealand have done much to destroy the character of the native plant communities — they would no doubt have, in some instances, been altered over the years with the natural spread of exotic species from adjacent areas, but the actual planting of certain exotic species within the confines of the reserves have speeded up this change. The abundance, even dominance, of *Lonicera japonica* (Japanese Honeysuckle) over the native trees along part of the coastal margin of the historic Ships' Cove reserve, Queen Charlotte Sound, is only one example of such senseless planting.

The beautification of bare or otherwise uninteresting roadsides around the country is also a matter which should be considered. Most of us know of persons who sow seeds or plant cuttings and plants on country roadsides to improve the scenery, and once the deed has been done leave the plants to look after themselves. While many will not survive, there is the real danger that the odd one which does survive may spread to adjacent farming land and prove a troublesome weed.

So ladies and gentlemen, let me conclude by asking you to accept that I do not want you to go away with the idea that I would take away all the pleasures from the horticulturalist's life, far from it, but that I would have you undersand and take with you the thought that "Horticultural discards *can* (and do) become national weeds" and that the horticulturalist has a definite responsibility to prevent this statement from having even more supporting instances than it has today.

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## THE BREEDING OF MODERN GERBERAS

KEITH DOWNES (*New Plymouth*)

Like the Colonel's Lady and Judy O'Grady, the modern gerbera and the African Daisy are sisters under the skin. They have a lot in common. When it comes to soil and atmospheric conditions their likes are mutual; but in many other ways they do not speak the same language.

As a genus the gerbera came out of Siberia, Natal, Transvaal and the Himalayas. Best known is *Gerbera jamesoni* representatives of which are found up and down New Zealand. It still claims faithful friends among old gardeners, but it has no hope in general competition with its hybrid relative the double gerbera, and its modern sister, the Tecolite single.



The rise of the gerbera to popularity is a fascinating story. But for haphazard breeding in India and conservative handling in New Zealand, would have been where it is now long ago. Years back when I became mildly interested in gerberas I wrote to many growers in Africa on the assumption that as the Continent was one of its homes there must be still better fish in that sea than ever came out of it.

How wrong I was. I found that the growers (the few who answered the enquiry) took small interest in the single, which was considered too common, and none at all in the development of the double. How the potentialities of the gerberas came to be overlooked for so long is beyond me. The most unexpected things happen in France. It was there that the first doubles made their appearance in the nursery of M. Dubois. And it was from M. Dubois that another Frenchman, Charles Maire, who had come to New Zealand, secured a few plants and built up a collection of doubles at Milford, Auckland. The first doubles I ever possessed came from Mr. Maire's son. A few of Mr. Maire's gerberas found their way into commerce, but it was inevitable that other breeders would be attracted by the possibilities of the gerbera. In recent years New Zealand growers, by hybridising and using the new Tecolite strain of single from America as a pollen parent, have produced scores of handsome new types in an amazing range of colour combinations.

Let me tell you something of the breeding of gerberas, which to me is the most absorbing part of their cultivation. The story is a simple one. The single is used as the pollen parent and the seed is set on the double. The best time to gather pollen is in high summer on a bright day between the hours of 10 a.m. and 2 p.m. If the anthers (easily distinguished because of their pronounced yellow colour) are agitated with a small soft brush they extrude their pollen, which can be caught in a small glass or plastic cup or transferred on the brush to the essential pistils. Some hybridisers use a finger for the purpose, but a brush makes it much easier. The females will be found coyly hiding behind the guard petals of the double. They have to be coaxed into the open by holding back the guard petals. Once they receive the pollen the rest is up to them.

There is one small but important "trick of the trade" that needs to be known to make a proper job of the hybridising. The females develop much sooner than the males (which explains why gerberas are not generally self-pollinating—a safety device by nature). The idea is to take the pollen from mature males and transfer it to young females on freshly open doubles. With a little practice and not too much eye strain, females in a receptive mood can be recognised by their shining faces. Under magnification, they are real jewels, glinting and glistening like pure crystals.

The seed soon sets. It is gathered when the head is ripe. To make sure that it does not take off hand in hand with the first puff of wind, as nature intended it should, so that it could see the world and find a home away from home, a covering may be necessary. It reaches ripeness in a hurry. And after that everything seems to be a bit of a

hurry with the gerbera. Each seed is equipped with a parachute for transport purposes, comparable to the down of the thistle or the wings of the sycamore and some maples. The seed can be planted sharp point down with the parachute exposed, in outside beds or in flats of sterilised soil. Sow as soon as possible. Gerbera seed soon loses its viability. Within half a dozen days the seed is up and doing. It might require some protection during the winter, and the young seedlings can best be planted out when the spring urge comes into the air. In seven months you may have your first blooms. For a perennial this is good going. The number of true doubles you may expect from a batch of singles on doubles is surprisingly high. Of course, the percentage varies, but until you have handled a large number of plants and become acquainted with the co-operative breeders and the shy ones you take more or less pot luck.

There is one golden rule which holds good for all types of breeding. The better the stock the better the results overall. And like a silver thread through the gold is the element of luck. For instance, we saved from the scrap heap a miserable little cream single which could not by any stretch of imagination or sentiment foot it with the new Tecolite beauty queens. But it was a healthy little fellow that had survived an overgrown section of the estate. It should have been wiped out by natural enemies, but it had survived. So it had its chance. As a pollen parent it was crossed with a sound red double. The result was roughly one hundred reds, many of them singles, some good doubles, some indifferent — and one single off-white double!

Now this off-white by accident was planted beside a towering member of the chamaecyparis family, and they began a happy association though their roots were in seemingly unequal competition. We called it "Pale Fingers." She threw one lovely bloom to begin with, and with shameless haste we brought her the pollen she so obviously deserved. She set 130 seeds immediately, of which 100 exactly produced a fine family. "Pale Fingers" proved a willing matron, a very dainty, full-of-life daughter of a runt who now occupies an honoured place in a corner of the garden and our hearts. So much for golden rules!

Gerberas are not fussy plants. They like a medium loam enriched with animal manure or compost, but not overdone with nitrogenous elements. Free drainage is important. In its natural habitat the gerbera blooms in the summer, the wet season, and is dormant in the winter, just the opposite from the conditions of New Zealand. Where soils are on the heavy side it is sometimes wise to lace the earth round the crowns with sharp sand. Plants quickly develop into large clumps which can best be divided in the spring each third or fourth year. Obviously hard and worn-out parts can be thrown away; tossed under the hedge, they often survive and thrive to confound the expert! The clump can be broken, preferably by hand into well-formed pieces with a leaf or so each. With the tops and fleshy roots trimmed back they soon throw out feeders if set with the base of the crowns just level with the soil surface and the big roots sent straight down like an anchor.

Gerberas seem to enjoy a soil which has been fortified with a dressing of blood and bone, a dusting of superphosphate, and potash if the soil requires it. Should they seem to need a tonic, a little sulphate of ammonia is relished, but it should not be overdone, or the plant might rush to leaf. Then the only recourse is to a barbering. Cutting back the leaves also lets in welcome light. Gerberas like a soil slightly on the acid side. Most New Zealand gardens answer that requirement without the "liberal dressing of lime" which seems to be the usual prescription for their good health. It is my opinion that we would get better results if we used the lime to clean our teeth and buried the container for compost.

The few diseases and pests which beset gerberas can usually be taken care of with modern methods. DDT emulsion fixes thrips and leaf miners, and Hexone knocks off any red mites. A soil fungus which worries seedlings can be controlled by sterilising. It is a pathogen which causes crown rot. Plants attacked should be removed and burnt, and the spot drenched with formalin (1 part to 49) to stop spread. Copper sulphate (1 lb. to 10 gallons) or Phygon XL (4 oz. to 10 gallons) can also be used. The same treatment applies for wilt. The commonest disease is *Septoria gerberae*. Its manifestation is dark brown spotting of the foliage, which bursts into showers of minute spores. Seen under a microscope these spores are like virile seeds, and the sight is enough to send one out hot foot with an application of either copper oxychloride at  $3\frac{3}{4}$  oz. to 4 gallons or some other modern fungicide. But the old story of prevention being better than cure holds good for this trouble.

One tip for those who like cutting blooms for the house. Leave the blooms on the plant till they have opened their petals well in towards the centre. If the stems are placed for a few seconds in  $\frac{1}{2}$  in. of boiling water and then plunged up to their necks in cool water overnight they will last ever so much better. The modern gerbera has taken its place with the carnation as a show bench plant, but it is such a newcomer that much has yet to be done to classify it. So many different forms of gerberas are making their appearance that those who like the competition of display will have to make some kind of rules.

A correct start has been made by the naming and registering of recognised gerberas. But I feel that gerbera organisations will soon have to divide their blooms into different classes, as is done with carnations, because recent breeding has been producing types distinctive from the formal, regular petalled forms.

There is no doubt that the gerbera has a most promising future in New Zealand. It is a very handsome member of the huge daisy family, destined to become a rival of the popular carnation in the garden and wherever people gather to show their blooms or admire (and fault!) the judge's placings.

**NEW ZEALAND TODEA FIBRE AND ORCHID GROWING***J. A. HUNTER, F.R.I.H.(N.Z.) (Auckland)*

The purpose of this article is to remind members of the Institute, and through them the horticultural and general public of New Zealand, that with the steady depletion of our bush areas danger exists that the Prince of Wales Feather fern (*Leptopteris (Todea) superba* (Col.) Presl.) may become extremely scarce. At our conference held at Wanganui in February this year a Hamilton delegate reported that large quantities of this fern were being removed from bush around Tongariro National Park to be used commercially as an ingredient in composts for orchid growing.

This magnificent fern (Fig. 1) is undoubtedly one of the gems of the New Zealand flora and well deserves the specific epithet that was given it by its discoverer, the Rev. W. Colenso. He found it near Lake Waikaremoana in 1841 and named and described it in 1846, placing it in the genus *Todea*. This decision was later revised and the fern was placed in the genus *Leptopteris*. It grows only in New Zealand and is found in dense bush, often at high altitudes, i.e. up to 3000 ft., but descends to sea level in the rain forest in Westland, the Sounds of South Otago and Stewart Island. It demands a moist atmosphere, shade, and comparatively cool temperatures, which therefore restricts its distribution in the North Island to mountainous regions extending northwards only as far as Te Aroha and Pirongia Mountains. In the drier Auckland bush only the inferior species, *Leptopteris hymenophylloides*, is found, while in the far north a closely related but very different species, *Todea barbara* (L) Moore, is not uncommon among the heath-like vegetation, often in full sun.

In *Leptopteris superba* the crown of plume-like fronds is borne on a short, thick trunk 2-3 ft. high and often 18in. in diameter. The fronds are graceful and may measure up to 4ft. in length. The brown stems of the fronds make a pleasing contrast with the olive green translucence of the fronds; these fronds are divided into linear segments which form dense overlapping tufts likened to the pile in fine velvet, and have been referred to by an eminent fern enthusiast as "Nature's Masterpiece."

This arrangement of the segments, according to the late Dr. Cockayne, enables the frond to hold more than its own weight of water; the number and fineness of the divisions, however, also encourages rapid evaporation, which explains why strong currents of drying air must be avoided when the plant is cultivated away from its natural surroundings.

Authorities differ on ease of culture, for the fern is certainly difficult to transplant even when young specimens are obtained. Some claim that it will grow under the bench of a cool, shaded greenhouse where the surroundings can be kept constantly moist; others maintain that the old-fashioned, but very efficient, warden case is essential for its existence when taken from its natural habitat.



It is the trunks, composed of densely matted fibrous roots, which constitute the fibre of commerce, and it is these which the report stated were being removed from the bush. The Forest and Bird Protection Society, Wellington, were also perturbed at the report and were desirous of assisting in any action being taken in the matter. They wrote to Mr. A. Farnell, who is an Honorary Inspector of National Parks and Reserves, and knows well the bush in the vicinity of Tongariro National Park, and who had inspected the district since the matter had been brought to the notice of the Institute. Mr. Farnell informed the Forest and Bird Protection Society that a considerable quantity had been removed from an area of bush cut, or being cut, 20 miles west of Erua. The Tongariro National Park reserves showed that, although trunks had been removed in quantity some years ago, no *Leptopteris* fern had been taken recently. However, in a State Forestry bush reserve on the top of the Mamakus on the Tirau-Rotorua highway, where, up till some five or six years ago, *Leptopteris* had flourished abundantly, only a few miserable specimens now remain.

There are indications that a great deal of the fibre from *Leptopteris* trunks, at present available commercially for inclusion in orchid composts, has probably come from King Country bush areas cleared during timber felling operations. It is realised that the cleared land is usually private property, and that when the bush canopy is removed and direct sun with drying winds is allowed access to the remaining vegetation, the shade and moisture-loving *Leptopteris* inevitably dies.

One would hope that this is the sole source of *Todea* fibre at present commercially available. Nevertheless, with an increasing demand for materials such as *Todea* fibre, our Institute, with other interested organisations, is emphatic that the removal of living specimens from an environment suited to their continued survival, and especially from our national parks, protected areas and Crown Lands, must be rigorously controlled. Therefore, all Institute members and others who have a love of beauty and a respectful regard for the rare and wonderful in nature, should be prepared to do everything in their power to protect this lovely fern. The police, forestry rangers, and honorary rangers have authority to take the necessary action when breaches of the law in this connection are made. Others can assist by reporting cases which come to their notice, and in every way possible assist the authorities in protecting this fern.

In this respect one is encouraged by the sympathetic attitude of executive members of the N.Z. Orchid Society. In an interview with them to discuss the question of appropriate action to safeguard this fern a motion was passed and placed on record that they were in complete agreement with any additional protective measures which would stop the unlawful removal of the fern from national parks, Crown lands and properties controlled by scenic boards; they were prepared to co-operate with our Institute in this matter. Considerable interest was displayed by members of this executive, and later by others interested in orchid culture, in discussions which centred around

the question "Is *Todea* fibre absolutely essential as an ingredient in orchid composts?" It became quite evident that differences of opinion existed. Some successful growers maintained that because of its resistance to decay it helped the compost to retain the desired physical condition for years, and thus was indispensable especially for all warm house orchids and for odontoglossoms among the cool orchids. Others, with equal experience and success in orchid culture, affirmed that the inclusion of *Todea* was *not* absolutely essential, stating that in the natural state native orchids never become established on it. They also claimed that by using other locally available materials such as the fibre from *Dicksonia fibrosa*, *Carex secta* (which for best results should be fresh), and paspalum turf from which all the soil has been removed, it could be dispensed with. However, they stated that if there was a tendency to overwater on the part of the cultivator, *Dicksonia* seemed to break down faster than *Todea*.

On examining the diversified ingredients recommended in orchid literature, one is impressed with the wide range of materials used both for epiphytic and terrestrial varieties. Therefore we are entitled to conclude that, provided the compost fulfils the universally recognised basic requirements, no one ingredient is indispensable, and that there is considerable latitude in one's choice. The compost must afford anchorage, retain moisture for a reasonable time, and provide nutrients for growth. The choice of materials includes: leaf mould, mosses (especially *Sphagnum*), peat, pine needles, *Osmunda*, *Polypodium*, *Asplenium*, *Dicksonia*, *Carex* and *Todea* fibres, charcoal, broken pots, sand, pumice, scoria, gravel, cork, and more recently, fir and pine bark. These last two materials are successfully used in America, entirely replacing, in some cases, the traditional *Osmunda* fibre which from the beginning of this century has been so extensively employed in orchid growing.

In New Zealand, growers are also experimenting with bark and considerable evidence is already available to prove that excellent cattleyas, cymbidiums, and some of the more difficult cyripediums can be successfully grown in this media or in composts in which bark is included. Some growers are using the bark in  $\frac{1}{2}$  in. pieces, others prefer  $\frac{1}{4}$  in. size downwards, with only the dust rejected. It is generally agreed that chopped bark is better than bark shavings, and that a mixture of fir (*Abies* sp.) and pine (*Pinus* sp.) is better than either used alone. Some native orchids grow naturally on *Pinus radiata* when it volunteers onto our native reserves.

The advantages of bark are its resistance to decay when used alone or as an ingredient in a compost, its availability at low cost, and the excellent growth response by plants to its use. As a result this new trend in orchid composts is likely to become very popular. It has been found that for best results judicious feeding is necessary when using bark, but as this has become established practice with many progressive growers, even when using traditional mixtures, it cannot be considered a serious disadvantage.

The accompanying photographs illustrate the excellent growth response which can be had without the use of *Todea* fibre in an orchid compost. Fig. 2 shows two plants of a hybrid cattleya, both from the same vegetative source and potted at the same time about two years ago. The plant on the left is in *Todea* fibre only, the one on the right in bark only. Note the vigorous root emergence from the leading growth in the bark compost. Fig. 3 illustrates a cymbidium with a flower spike, only 18 months from a back bulb. It is growing in bark, peat and sand, and 12 months ago was shifted from a 4 to a 6in. pot. As can be seen from the photograph, the growth of the new bulb is excellent. With some cypripediums it is not easy to illustrate vigorous root growth 12 months after potting. Fig. 4 shows the root growth of a plant of a cypripedium hybrid one year after it was potted in bark, peat and sand. For the rapid establishment of a slipper this root growth, in the time stated, is excellent.

From evidence I have gathered, and from conversation with many growers who are prepared to change from traditional methods, there is no doubt that good specimens of different genera of orchids can be grown without *Todea* fibre. There is therefore no valid reason why our unique *Leptopteris superba* should be taken from areas where the bush is undisturbed and where, if left alone, this beautiful fern will continue to flourish and delight future generations with its graceful beauty as shown in Fig. 1. I am confident that an appeal such as this will not pass unheeded by a New Zealand community.

### Acknowledgments:

I gratefully acknowledge the courtesy of the Auckland Institute and Museum for permission to publish Mr. J. Martin's photograph of *Leptopteris superba* taken during last century on the Rotorua-Waikato road. I am indebted to Mr. D. J. Buckland, an Auckland grower, who kindly allowed plants in his orchid collection to be photographed, and to Mr. S. A. Rumsey for the photographic work in connection with this article.

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## ORCHID CULTURE IN NEW ZEALAND

H. BLUMHARDT, *N.D.H.(N.Z.)*,

*Orchid Grower to Sir Frank Mappin Bart., Auckland.*

### PART II.

#### Propagation

One thing that all plantsmen find fascinating is propagation, and orchid growers are no exception.

#### (a) Raising Seedlings

Before discussing methods of seed sowing I should like to point out that time and patience are two essentials, as orchid seed takes anything from 6 weeks to 6 months for the first leaf to form, and the earliest one can expect a plant to reach maturity from seed under normal cultural

conditions is about 6 years. However, if special facilities and conditions are available this may in some cases be achieved a year or so earlier.

There are two main methods of seedling raising, namely symbiotic and asymbiotic, of which I shall deal only with the former, leaving the latter to someone more qualified as it is almost a laboratory technique.

To deal briefly with the symbiotic method, some mature plants are selected, the pots of which contain compost in sound condition. These are thoroughly watered. A fine sprinkling of seed is then made on the top of the compost in each pot, which is then afforded heavier shade. It is from now on most essential to keep the surface continually damp. This may be most easily accomplished by spraying it frequently with water from a scent spray. This may be necessary some three or four times daily during bright weather. These pots should not be watered with a can as the seed, which is extremely fine, would be washed away. When watering is necessary the pots should be plunged. In four to six weeks, small green globules should be visible, from which time on watering may be done with a fine-rosed can. When leaves have formed and the plants are large enough to handle, they may be pricked out in trays or pans of specially prepared fine potting compost where they should be allowed to grow until large enough to be potted individually into small pots.

Seedlings must never be allowed to suffer from want of room but should be potted on as required into pots one size larger. On the other hand, care must be taken not to over-pot, as this only tends to cause sour, stagnant conditions and consequently weak root growth.

### (b) Vegetative Propagation

The quickest method of increasing the number of flowering plants is by vegetative reproduction. This is best done in early spring, as in most cases growth is just commencing at that time. There are some exceptions to this, such as most of the branching types, e.g. vandas, and epidendrums of the *radicans* group, which may be increased by true cuttings as roots are active almost all the year through.

Pseudo-bulbous forms such as cymbidiums, odontoglossums, some oncidiums and epidendrums, etc., are readily increased by severing the rhizome between the pseudo-bulbs with a sharp knife, leaving the severed portion undisturbed. If desired the back bulbs may be removed and inserted about one third of their depth in damp sphagnum moss, sand or sawdust until growths and roots are being formed, when they may be potted up in the normal manner in small pots.

Cattleyas, laelias, etc., may be increased in a similar manner to the above, the only difference being that the back bulbs retain their leaves much longer than those of cymbidiums.

One very important point appertaining to the propagation of all bulbous orchids is that the plant to be increased must not be reduced to less than a three bulb plant, as if this were done it might seriously affect the vigour and flowering capacity.

Cypripediums and all similar forms devoid of pseudo-bulbs, I find, are best propagated by severing the rhizome behind the second



or third growth, leaving the back portion otherwise undisturbed in the pot until next time the plant is repotted. Then it may be separated from the parent plant.

Dendrobiums may be vegetatively propagated following the procedure described for cypripediums. However, a more rapid method of increase is to cut the older pseudo-bulbs into short lengths, each with at least two nodes. These are then stood in damp moss and placed on gentle bottom heat until growths with roots are formed, when they may be potted up in the usual manner.

### Pests and Diseases

Fortunately these troubles are very few in New Zealand as some of the more serious pests have not as yet been recorded here.

In most cases where pests and diseases are troublesome, I am sure that the causes will be found in faulty cultural conditions, e.g., heavy infestations of red spider usually indicate hot dry conditions, and most diseases may be attributed to poor root action caused by faulty watering or potting or by insufficient light and ventilation. Where woodlice or cockroaches are troublesome untidy conditions within the glasshouse are usually to blame, as these pests breed rapidly under any dry material which may be stored or deposited in the glasshouse.

The most serious complaint of orchids is undoubtedly virus, of which there are several forms. Some are only evident by breaking, streaking, or deformity of the flowers, while others mottle or streak the foliage with black or chlorotic marks; still others may cause the complete collapse and death of the plant. All call for strict hygiene and control of insect pests which can transmit infection from plant to plant. All utensils such as knives and scissors should be sterilised by dipping in zepherine or by flaming, between use on different plants. At the moment the only known control is to burn affected plants.

The following table gives the main pests and diseases and the control I have found most effective.

<b>Pest or Disease</b>	<b>Control Measure</b>
Scale insects - -	Wash or spray with White Oil
Aphids - - - -	Spray with Lindane or Nicotine sulphate
Mealybug - - -	Wash or spray with Malathion or White Oil or dab with Spirits of Wine.
Red Spider - - -	Syringe with water or spray with Malathion or Azobenzene Aerocide 'Bomb' (AB30).
Cockroaches and Woodlice	Dust under and around benches with DDT powder or Lindane.
Ants - - - -	Spray with DDT or Lindane or lay poison.
Slugs and Snails -	Metaldehyde spray or baits.
Cercospora ) - -	Spray with Thiram*. Keep atmosphere
Glomerella ) - -	drier.
Black Spot ) - -	

\*Captan may be even more effective, but trials are necessary before it can be generally recommended.

- Dry Rot - - - Remove affected parts and burn. Rub in flowers of sulphur.  
 Virus diseases - - Burn affected plants.

### Watering

I am sure the key to successful orchid culture lies in careful watering.

All orchids while growing vigorously respond to abundant supplies of water, but on no account should the pots ever become waterlogged and sour. More plants are killed by overwatering than from any other cause. Deciduous types require very little water while dormant and evergreen species, although requiring less water during the winter months, should not be allowed to remain really dry for long periods. I find that if this is allowed to happen the roots tend to dry out and become papery, giving a check similar to that which plants receive when their roots are lost from overwatering.

The secret in watering is to water only when really required and then to do it thoroughly, preferably by dipping each pot and then leaving it unwatered until it is really necessary to give a soaking again. If dipping is not practicable, as is the case with larger collections, I strongly advocate the use of a small watering can. On no account would I recommend the use of a hose, as the tendency is to water negligently. Owing to the fact that city supply water is sometimes strongly chlorinated and consequently has a high or alkaline pH value I prefer to use rainwater, as a high pH will cause rapid degeneration of the compost and most orchids prefer a pH value of between 5 and 7.

Cattleyas, cyripediums and in fact most orchids will not tolerate water lodging in and around flower stems or sheathings or inside the young growths, as this very often encourages decay. Care must therefore be exercised on this count when watering.

### Potting

Correct potting is an art only acquired with practice and, coupled with watering, spells either success or failure.

The only correct time to repot is just as root growth commences. This is usually in spring and allows for a full season's growth without any further check to the plant. Admittedly some orchids, such as cattleyas and odontoglossums and their hybrids, usually provide the opportunity twice a year for repotting. Young roots are produced on cattleyas when the new growths are only a few inches high and again after flowering, that is, when the season's growth is completed. I prefer the latter time in most cases, provided it does not occur during mid-winter. I find that the new growth produced is usually more vigorous than if the plant is disturbed for potting in spring. Odontoglossums may be potted in either spring or autumn, as new growths are usually produced in both these seasons.

Although these potting times are the best, it is sometimes necessary to repot irrespective of whether new roots are produced or not. For instance if, as is sometimes the case, a plant is discovered which is not in good health and, on examination, it is revealed that the compost is in a stale or decayed condition not acceptable to new roots, I recommend immediate repotting and subsequent careful attention to watering.

Orchids generally do not require to be repotted every year. Every three years is sufficient, in fact preferable in most cases, providing the compost used is of good lasting quality.

When to pot is determined by:—

1. Root activity — As previously mentioned, the only time to repot is when the plant is making new roots from the foremost or leading growth. If new roots are not being formed the plant is liable to take a long time to recover from repotting at the expense of strong growths and flowers.
2. Health of the plant — If a plant does not appear healthy the cause may be a poor root system and it should be repotted at the first opportunity.
3. The condition of the compost — This is very often the cause of the preceding condition, for when the compost decays it sometimes becomes sour and retentive of excessive moisture.
4. The amount of room in the receptacle — If it is apparent that the next growth to be made will protrude over the pot, the plant should be repotted, or in the case of small plants, potted on.

### Potting Mixtures and Materials

There are, I think, as many potting mixtures as there are orchid growers, probably many more as everyone seems to have his own pet mixtures even for different species. These give good results under their own individual conditions and handling. The main deciding factor is the availability of the ingredients. The requirements or desirable features of a good compost are:—

1. One which retains its physical condition for about three years.
2. One which promotes strong root action.
3. One which provides sufficient food, not only immediately after potting.
4. One retaining sufficient moisture to alleviate too frequent watering but at the same time providing good drainage and aeration.
5. One having the desired pH value for the plants to be grown in it.

The following are some of the materials which are used in New Zealand as constituents of potting composts:—

- \**Todea superba* (syn. *Leptopteris superba*) fibre
- Dicksonia fibrosa* fibre
- Fibrous turf or loam fibre
- Polypodium fibre
- Oak leaves or leaf soil

\*See p. 342 "New Zealand *Todea* Fibre and Orchid Growing."

Tan bark  
 Astelia (in variety)  
 Sphagnum moss  
 Scoria or coarse sand  
 Cow or sheep manure (sun baked)  
 Bark (pine, gum, pohutukawa, etc.)  
 Fibrous willow root.  
*Carex secta* roots (nigger heads)  
 Osmunda fibre (imported)  
 Peat or imported peat moss  
 Brick chips.  
 Sawdust.

From this list it may be seen that a large variety of materials may be used, and that orchids are not too fussy about what they grow in. This leaves the grower to decide which combination to use after bearing in mind the foregoing features of a good compost.

Having decided on the compost to use I have compiled a list of rules for potting.

1. Pots, which should be clean, should be crocked to about  $\frac{1}{4}$  full with clean crocks to provide good drainage and aeration.
2. Do not overpot, but always allow sufficient room for three years' growth.
3. Shake out all broken down compost when repotting and carefully cut off all dead or damaged roots.
4. Never leave air pockets under the base of the plant or between the roots.
5. Don't bunch the roots together. Carefully pack compost between them.
6. Never exert too much pressure on compost surrounding young roots, but firm potting is advisable in most cases.
7. Always leave the surface of the compost, when finished, below the rim of the pot to allow for watering.
8. Always use compost which is slightly damp, as dry compost will not pack as firmly as moist.
9. Don't use compost a second time, even though it may appear quite sound.
10. Although it may not be general practice, I prefer to give newly potted plants a thorough watering after potting. No subsequent watering is required for some considerable time and I find that as a general rule plants rally quicker this way.

### Manuring

Orchids, like all other plants, require a certain amount of food, but I must strongly emphasise the risk of overdoing it. Many a good plant has been killed by the generosity of its owner. If tempted to manure remember the old rule "a little and often — but not too often" is much safer than one big feed. Do not be tempted to give a little bit more each time.



Fig. 1—*Leptopteris (Todea) superba* on the Rotorua-Waikato road, taken during last century. (See page 342)



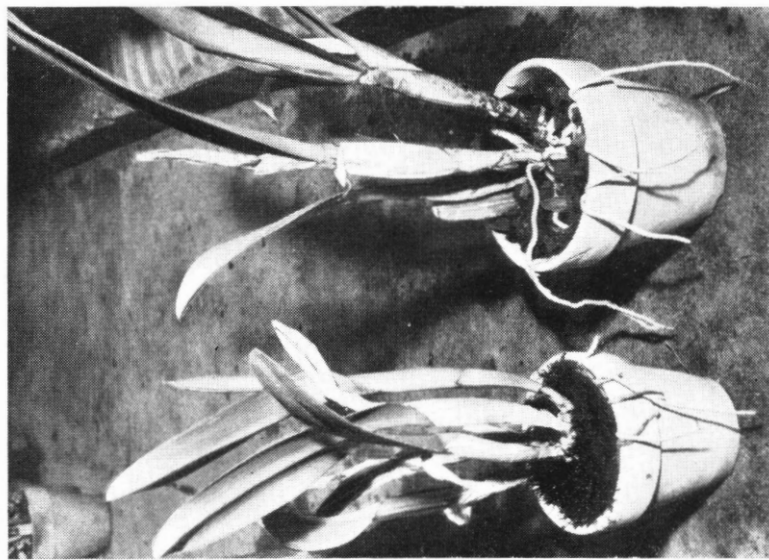


Fig. 2—Hybrid cattleyas potted about two years ago. The plant on right is in bark only, that on the left in Todea fibre only. Note the vigorous root emergence from the leading growth of the plant in bark. (See page 345)

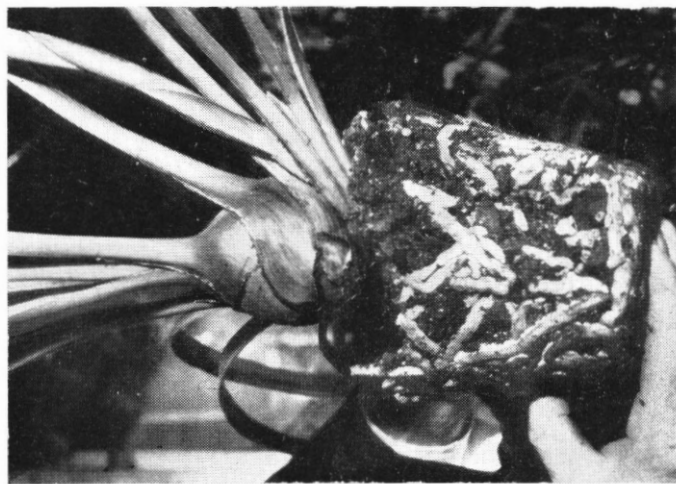
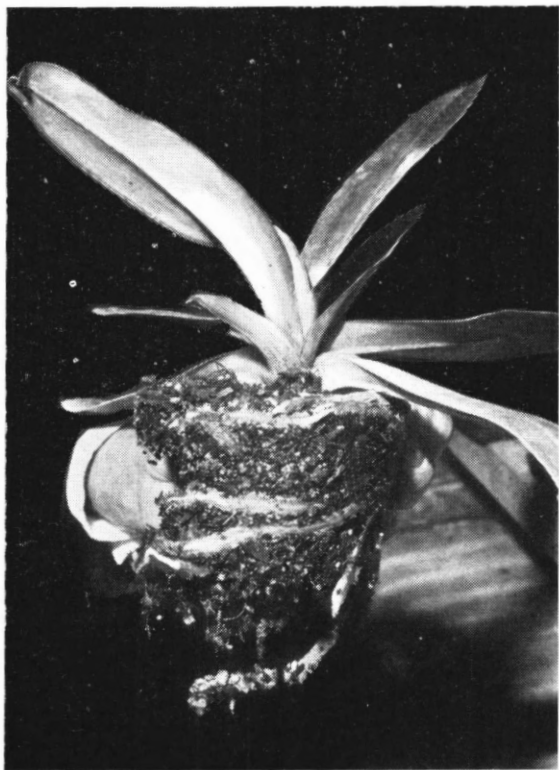


Fig. 3—Root growth of a cymbidium hybrid 18 months from a back bulb, and growing in bark, peat, and sand. Note the flower spike and the large new bulb. (See page 345)

Fig. 4—

*Root growth of a single lead of a cypripedium hybrid 12 months after potting in bark, peat, and sand.*

(See page 345)



*Senecio hectori* (See page 354)

A group of modern double and single gerberas. Hybrid doubles come in a fascinating range of new forms. Lower left is a form of the *Gerbera jamesoni*, the original African Daisy from which most modern gerberas are descended.

(See page 33.)



—Photo by Douglas Elliott.



The small cream gerbera (centre) was used as the pollen parent for the double (Pale Fingers,) on the right. The seed parent was a double red. On the left is a modern single gerbera of the Tecolite strain. (See page 340)

—Photo by Douglas Elliott.

While liquid manures, either chemical or animal, are advocated by some, I prefer to use a small quantity of hoof and horn manure or bone dust in my potting compost as this is a safer way to feed, not giving a feast and then a famine as maybe is the case with liquid feeds.

Another method of feeding which I found to give excellent results with plants which have been in their pots for some time is to dust the top of the compost occasionally with a pinch of bone dust and allow it to wash in when watering. By doing this I have seen the size of growths doubled.

One point to remember about manuring — avoid the use of too much nitrogen as this only produces soft growths which will not flower.

These general notes will be amplified in future articles dealing with particular genera. I trust they will assist new growers to solve problems associated with orchid culture, and also that they will induce other gardeners, who have not yet entered into this interesting field of culture, to become successful growers of these fascinating plants.

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### SIR JAMES HECTOR

*A. W. ANDERSON, A.H., R.I.H.(N.Z.) (Timaru).*

James Hector was born in Edinburgh in 1834. His father, who was a writer to the Signet, was very friendly with Sir Walter Scott and the two collaborated in the translation and transcription of ancient documents. At the age of 14 the boy entered his father's office and four years later, having in the meantime served three years as an apprentice to an actuary, began his studies at Edinburgh University. There he soon came under the notice of Professor Balfour who was at that time making an intensive study of the mountain flora of Scotland and he gave the young man great encouragement by selecting him to report to the Botanical Society on the geological and other features of the ground covered in various plant-hunting expeditions.

So it came about that geology soon grew to be young Hector's favourite subject and this led him, after graduating M.D. in 1856, to take the position of surgeon-surveyor in an expedition sent out to explore the country lying to the west of Lake Superior, with the view to opening it up for settlement and at the same time finding the best way through the Rocky Mountains to the West Coast of Canada.

During the four winters he was there, and while the expedition was nominally inactive, young Dr. Hector selected a few volunteers and, with the help of Indian guides, explored some 1,200 miles of prairie country. His Indian friends taught him how to travel light, using snow shoes and dog sleighs, sleeping in the snow at temperatures 50° below zero and, with the exception of a little pemmican, living off the land.

When the explorers returned in 1860 they had opened up great tracts of territory suitable for settlement, defined much of the boundary

with the United States and discovered no fewer than five passes through the Rockies. The best known of these passes is Kicking Horse Pass which proved to be the key to trans-continental travel and within the short space of 30 years the Canadian-Pacific Railway was using it daily in the long journey from Montreal to Vancouver.

### **Kicking Horse Pass**

There are two versions of the reason why the pass came to bear its curious name. Writing in his Journal at the time, Hector tells how the explorers were making their way up the Columbia River when they came to a tributary entering at a remarkably sharp angle. "Just above the angle," he wrote, "there is a fall of forty feet in height where the channel is concentrated by precipitous rocks. A little way above the fall, one of the pack horses, to escape fallen timber, plunged into the stream, luckily where it formed an eddy, but the banks were so steep that we had great difficulty in getting him out. In attempting to catch my own horse, which had strayed off while we were engaged with the one in the river, he kicked me in the chest, but luckily I got close to him before he struck, so that I did not get the full force of the blow. However, it knocked me down and rendered me senseless for some time."

When Hector recovered consciousness he was horrified to find that he couldn't move and alarmed to find that his companions were so sure that he was dead that they had already dug his grave. It was only by winking his eyelids that he managed to save himself from premature burial. Gradually he recovered and that night they named the river, Kicking Horse River. They followed it to its source a few days later and the 5000ft. pass was naturally called the Kicking Horse Pass.

More than forty years later when Sir James (he had been knighted in 1886), visited Canada with his honours thick upon him, he was given a wonderful welcome. As one writer said, "the visit partook almost in the nature of a royal progress, and a monument was erected to his honour by the Canadian Government, at the highest point of the Great Divide, in order to commemorate his youthful discoveries."

It would appear that on this occasion someone asked Sir James how the pass came to be named and he, having apparently forgotten the exact circumstances, said something which was written up into a tale of the exploring party traversing a ledge in single file when the horse took fright and kicked and tragedy was very narrowly averted on the sharp rocks far below. By this time both Sir James and the Pass were famous and this version of the tale was widely spread, and is the more generally accepted. I think the first must be the truth; it was written at the time and is so circumstantial as to ring true.

### **Exploring Otago**

On his return home Dr. Hector's reputation was made and he received many honours. He was given the choice of two positions, either Political Agent and Geologist in Cashmere or Provincial Geologist in



Otago. Being an adventurous young man he chose the latter although the salary of £800 a year on a three-year contract, was considerably smaller.

His early training under Prof. Balfour had given him a keen interest in botany and he had managed to do some collecting in Canada. This brought him into contact with Sir Joseph Hooker at Kew. Hooker was keen to know something about the vegetation of the Otago hinterland, then completely unknown. He gave Hector a letter of introduction to Haast of the Canterbury Museum and advised him to look up John Buchanan, an amateur botanist in Dunedin who had sent some specimens to Kew which Hooker thought should prove very useful to any party exploring the interior.

Soon after his arrival in Dunedin, in April 1862, Hector made an effort to find Buchanan but was unable to do so until he had advertised in the local newspaper. The two men met, undertook many exploring expeditions together, and became lifelong friends. Hector began exploring the interior of Otago right away and soon found that it was of the utmost importance to see if there was any way of finding access to the West Coast. He found his Canadian experience of great value and made a practice of travelling light with bacon, tea and flour as his mainstay, supplemented by a home-made sort of pemmican, made by cutting mutton into slices, drying it in the sun and pounding it before pouring melted fat over the substance and packing it in sheep-skin bags.

### A Gruelling Experience

The first attempt to reach the West Coast began in February when Hector, Buchanan and a few others set off to explore the country lying to the west of Lake Wanaka. When they reached the Matukituki Valley they were astonished to come across a wood-cutters' camp where about a dozen men were felling beech trees for the goldfields of Otago. The logs were floated down the river, across the lake and down the Clutha.

The party soon found the bush too thick for horses and so they turned them loose and proceeded on foot, carrying 50lb. packs. But one day was enough and next morning they cached half their supplies, hanging them from the branches of a large beech. Five days later they reached the top of the narrow pass now known as Hector's Col and were able to look over towards the coast, but their way was barred by a gigantic glacier. I visited the spot 66 years later and found it one of the most beautiful in western Otago but incredibly inhospitable. Gamely they pushed on through this extremely rough country and managed to reach within some 8 miles of the coast before the incessant rain and lack of food forced them to turn back.

The return journey was a nightmare and they had to eat their leather belts before they reached the 25lb. cache. Even there they were doomed to disappointment for rats had spoilt everything except two tins of sardines. With this meagre fare they struggled on and managed to reach their first cache. The task of catching their semi-wild horses was not easy in their exhausted condition.

Back in Dunedin, Hector at once set about making arrangements to reach the West Coast by sea and come home overland. He sailed in May and at Bluff had his first feed of "mutton-bird, a disagreeable Maori delicacy," and after visiting various sounds and examining a "tangiwai" quarry at Anita Bay, near Milford Sound, reached Martin's Bay in September.

There he found the remains of an extensive Maori pa which had belonged to the once-powerful Ngati-mamoe tribe, but all had vanished except Tutoko, an old chief, his wife and daughters Sarah and Mary. He spent a little time exploring and named Mount Tutoko, one of the most inaccessible and impressive peaks in Western Otago after the old chief. When he followed the Kotuka River to its source he named the hills on either side of the river after the two Maori girls, the Sarah Hills to the north and the Mary Hills on the south.

Then he set out on his historic journey from Martin's Bay to Lake Whakatipu, through what is now amongst the best known and most beautiful of the fairly accessible parts of Otago. He followed the Hollyford River to reach the Greenstone Pass and down the Greenstone to the Lake at Elfin Bay. On his return he was able to report on this easy route from the West Coast. This route is now covered by scores of trampers every summer.

### Two Interesting Plants

Although his field was geology, Hector's name is writ large in the flora of this country. Together with Buchanan he was the first to collect any specimens of the alpine flora of Otago and there are many occasions in which these two collectors are cited in Hooker's "Handbook of the New Zealand Flora" of 1867.

Most decorative of the species that bear his name is the handsome *Senecio hectori* from the warm humid valleys of Nelson where it ranges from about 200 feet above sea-level to a little over 3000 feet. Easily recognised by its thin, spear-like, foot-long leaves, light green and thinly vested on the underside with pale cottony tomentum, and the great corymbs of starry white flower-heads, each 2in. across or more, it is still plentiful in the Buller Gorge, lighting up the dense shrubberies that fringe the river, just as it did when Hector found it there in 1872. When Buchanan named it for his friend he noted that this was not the original discovery as the plant had "been reported by W. T. L. Travers as occurring at Whangapeka and a few other localities in the Nelson province," where he had collected specimens many years ago.

Although it has but little beauty Hector's other plant is infinitely more interesting. This is the famous *Tainui* which was first seen by him growing in about an acre of ground, on a spur of the low sandy hills near the mouth of the Mokau River, which now marks the boundary between Auckland and Taranaki. In December 1878, he says, "The peculiar habit of the trees first attracted my attention, having a resemblance to a clump of apple trees, so that at first glance I thought it to be an old orchard or cultivation. I was afterwards

much interested in hearing from the Natives that a peculiar tree was growing on the spot where their ancestors first camped when they abandoned the Tainui canoe, in which they came from Hawaiki, and that this tree had sprung from the rollers or skids, and the green boughs that were brought as flooring to the great canoe. On my doubting this they offered to take me to the place and if I could not recognise the tree as being found elsewhere in New Zealand, they would consider it proof that the tradition was correct.

"To my surprise, they took me to the clump of trees I had previously observed, and as it was certainly quite distinct from any other plant hitherto described from New Zealand, the tradition receives a certain amount of confirmation, and, I need hardly point out that if it were true, and we could hereafter determine the original habitat of the tree, it might give a clue to the whereabouts of the mythical Hawaiki, or the place whence the Maori migrated to New Zealand."

Hector described the plant as *Pomaderris tainui* and pointed out that while it betrayed certain affinities to *P. apetala* which had been found in Australia and Tasmania, in his opinion it was so distinct as to be worth specific rank in its own right. More thorough knowledge of the species has not confirmed Hector's diagnosis and the plants are now considered to be identical. That means that the old Maori tradition was without foundation because all the evidence goes to show that the Tainui voyagers knew nothing of the lands across the Tasman Sea. The Tainui is not by any means a decorative shrub. Reaching some 15 or 20 feet it is ungainly in habit with dark wrinkled leaves which, together with the young growth, is clothed with a scruffy brownish-white tomentum. The minute flowers are produced in great profusion in loose plumes, but the dull yellowish colour is not really so attractive as the grey-green buds. Nevertheless the Tainui is always worthy of a place among our native plants because of its link with ancient tradition.

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## DR. A. P. SAUNDERS' PAEONY HYBRIDS

*SYLVIA SAUNDERS (U.S.A.)*

### (2) Herbaceous Paeonies.

In the preceding issue of this journal we discussed the hybrids originated by Dr. A. P. Saunders in the shrubby half of the paeony kingdom — his so-called *lutea* hybrids — children of the great flamboyant Japanese tree paeonies crossed on to the small wild yellow tree paeony from China, *P. lutea*. In this issue we shall take up what appear to be two of the most important of his many originations in the other half of the paeony world, the herbaceous paeonies.

If we go back and start with ancient history, we find that the same thing happened in the herbaceous as in the tree paeonies. Centuries ago, the Chinese rescued one lucky species from the wilderness; an ordinary enough little plant, with the usual white or muddy-mauvish-pink flowers so often seen in the wild. They took it into their gardens, and there

it was cultivated, treasured, and developed through hundreds of generations of selection and care. The Chinese, and later the Europeans, and still more recently we in America, have made of it one of the glories of our modern gardens. It is still what it has been for over a hundred years, one of our most beautiful and widely-loved plants. Tens of thousands of blooms are sold yearly to florists for the cut-flower trade, and thousands of root-divisions are shipped every autumn by the nurseries, at from 50 cents to 50 dollars apiece, to be grown in your garden and in mine.

We now call this species and all its thousands of direct descendants *Paeonia albiflora*; or if you prefer, *P. lactiflora*, *P. sinensis*, or *P. chinensis*. These Chinese paeonies, for such they are, offer us a full four weeks of bloom; the flowers range in form from airy singles to huge plump doubles — they're even called "bombs" — and from white through various shades of light and deep pink, to old rose and on into the crimson. They are among the hardiest and most easily grown plants that we have. For these reasons, and no doubt also because they are in the gardens of all of us, *albiflora* has served as the mother plant in by far the large majority of hybrid originations. Hybrids are usually named simply after their male parent. So that when we speak for instance of the *lobata* hybrids, we safely take for granted that *albiflora* is the other parent in the cross.

Now the herbaceous section is rich in species, there being at least thirty or forty that are really separate and distinct. But now our troubles begin, for several of these are themselves large groups, and consist of a number of forms or varieties, many of which closely resemble one another, yet are not exactly alike. This situation is not so bad among the species from Asia, but is rather serious among those of Europe. For it appears that in the last Ice Age, some 20 million years ago, which botanically speaking of course was only the day before yesterday, Europe was covered with ice, whereas Asia was not. Asia's plants are therefore older by quite a span of years than the European plants, many of which have not yet had time to become settled down and differentiated out into separate, well-defined species.

Oddly enough, so far as we know and can judge, the paeony species seem never to have been intercrossed until nearly our own day. We have no reason to believe, for instance, that in our modern *albiflora* varieties there is any other blood than that of the one original wild *P. albiflora*. It is true that in about 1890, several hybrids were produced (we shall speak of some of these later on) but they were few, and have not proved important, either as ancestors of other hybrids, or as garden plants.

Then a curious thing happened: in about 1917 or 1918, some five men in America began, quite independently and unknown to one another, to cross *albiflora* with *officinalis*. Mr. Edward Auten Jr., and the late Lyman Glasscock have each introduced many strikingly beautiful hybrids, including a number of brilliant light reds, some fine black velvet reds and even a few lovely pinks. These plants, in their new colours and

fine stature, have made splendid and permanent additions to our gardens. A few more hybrids have come to us, too, from others' hands.

Paeony growers have long felt that among the *albiflora* varieties the greatest lack was in the pinks. Yes, there are lovely blush pinks, and some deep rosy ones, then they go into old rose. But there is nothing that could truthfully be called salmon or peach, not to mention coral or cherry — colours so often found among the tree paeonies, but entirely absent in the herbaceous. Hybridists, then, were rather on the lookout for a species which, when crossed with *albiflora*, would produce a strain of the beautiful missing pinks. Of course yellow, too, is absent, but that is another story.

Among the wild species, some are white-flowered, but by far the larger number are in muddy mauve-pink or in a rather violent magenta purple; colours undesirable from anybody's point of view, and certainly not likely to produce anything like salmon pink. One species offering us something better in the way of reds, and even a good pink or two, is *P. officinalis*. Originally from southern Europe, *officinalis* comes in thirty or more forms, or varieties, one of which at least is well-known to us all, being the old May-blooming crimson "piney" of our grandmothers' gardens.

Dr. Saunders worked with both *albiflora* and *officinalis* from the first, and in the course of time, with as many other species as he could lay hands on. Coming via the Botanic Gardens in Leningrad and Tiflis as well as others of the Continent and the British Isles, and through private collectors of seeds and plants, many species from Asia, the Himalayas, the Caucasus and southern Europe reached a new home on College Hill. Some very soon found the conditions of life in central New York State not at all to their liking, and perished. Others were heaved out, in whole or in pieces, by our stiff clay in the alternate freezings, thawings, and re-freezings of a normal Clinton winter. Still others proved not to be species at all, but accidental hybrids made by air-borne or bee-borne pollen in the nurseries from which they had come; they were sterile, and eventually got heaved out by the hand of man. In due course however, Dr. Saunders did manage to collect pretty nearly all the paeony species and within a few years he had enough hybrid strains coming along to keep time from hanging heavy on his hands.

One of the many forms of *P. officinalis* is *P. lobata*, which itself comes in a number of varieties, some with flowers of bright red or brilliant clear vermilion, and even a rose pink. Among *P. lobata* in the garden was one plant which had arrived in 1928 from Amos Perry of England. It bloomed on June 18, 1929 and was forthwith crossed onto the *albiflora* varieties in bloom that week. Dr. Saunders' experience had taught him that crosses involving *officinalis* or *lobata* took very poorly, the average yield being usually only two, three or four seeds to a cross. The flowers of "*lobata* Perry," as it is known in our records, were of a light vermilion colour of great brilliance. Hoping against hope that in this vermilion might lie the colour break to the

fine pinks, and determined to by-pass *lobata's* natural stinginess in the production of seeds, Dr. Saunders made, that June, one hundred and eighty-nine crosses between "*lobata* Perry" and *albiflora* varieties. What was his astonishment to harvest in August and September more than three thousand seeds! About sixteen seeds per cross! And that was not all, for with prodigality of seed-setting went prodigality of germination. Some twelve hundred little plantlets — and 40 per cent. is an extremely high ratio in the annals of paeony hybrids — were set out from the seed beds two years later. And in 1934 and 1935 when these came into bloom, amazement gave way to ecstasy as we found that they were, every one, in glorious reds and heavenly pinks, all entirely new to the paeony world, and with never a bad shade among them. Here were palest salmons, peach, rose pink, coral and cherry in profusion, fine light scarlets and brilliant cerise crimsons. Many of these open deep, then pale off, so that a mature plant may bear fifty blooms in varying shades of deep and pale pink, but there is no clashing, and the crimsons never turn purple. The forty or fifty finest were, over the course of years, selected, propagated and offered on the market. Names such as "Janice," "Laura Magnuson," "Alexander Woolcott" and "Carina" are well known.

These *lobata* hybrids follow the rule for first generation hybrids: they are sterile. But among the F<sub>2</sub>'s (seeds from any F-1, set by nature without any hand pollinating) is the beautiful creamy-yellow "Moonrise," in colour harking back to who knows what ancestor? And I believe owners of *lobata* hybrids will be well advised to gather and grow whatever seeds their plants may grudgingly yield to them.

And this brings us to the last hybrid strain of our present story, actually the most recent in this nursery. Native to the Caucasus region are four species over which we must pause a moment, for each is in its own way distinct, beautiful and important to us. One is white, one crimson, and two are pale yellow.

The white is *macrophylla*, the big-leaved paeony; this is well-named, for its very leaflets are the largest in the entire paeony genus, often measuring 9 x 12 inches. They are coarse, highly glossy in texture, and in the sunlight give off a strong odour of English box. The flowers are small and creamy-white. The famous hybrid "Chalice," is of the cross *albiflora* by *macrophylla*. Our second species, *P. tenuifolia*, is almost *macrophylla's* exact opposite: its leaves are the smallest in the paeony world, ferny, even asparagus-like. With its little crimson blooms, it is familiar in the gardens of many of us as a delightful small harbinger of Spring.

The names of the two remaining species are tongue-twisters: *P. wittmanniana*, and *P. mlokoszewitschi*; but I beg you if you do not already know it, to learn the second of these, even if only as "Mloko," or, as Mrs. Francis King used to call it, simply "Mlo," for it is not only one of our most beautiful paeonies, but one of the loveliest of garden plants, and though not always sure to succeed, should at least be tried in every garden.



*Wittmanniana* was one of the two or three species used by hybridists previous to 1917. Victor Lemoine crossed it on to *albiflora* and produced a group of charming early-flowering plants, of which the names "Le Printemps" and "Mai Fleuri" are perhaps best known. Their flowers are pale tea-rose with a sort of café-au-lait cast.

*Wittmanniana* and *mlokosewitschi* are both pale yellows, and as such, seem to offer our best hope of producing a strain of yellow double hybrids. "Wittmann" is of so delicate a constitution that we perhaps have a blessing in disguise in the fact that it is the less good of the two species: its flowers are paler, and the whole plant and its habit much less distinguished. Even including Lemoine's, there are few *wittmanniana* hybrids in existence, for it is hard to make consistent use of a plant that is forever dying off and having to be replaced.

"Mloko" — if I may have your permission — is a dream of a plant. Its leaves are a jade-grey-green, gently reminiscent of the eucalyptus and unique in the paeony kingdom. The stems are often purple-crimson. Its flowers are a pale but perfectly clear saffron yellow, and they have a spicy odour — is it of cloves? I know of nothing more lovely than a group of "Mloko," with *poeticus* narcissus planted among them, all in flower together, in mid-May (Northern Hemisphere). "What may we not hope for," exclaims the hybridist, "if we can but combine Mloko's exquisite qualities with the doubleness and greater hardiness of *albiflora*!" Alas! With all her beauty, her ineffable aristocracy gets the better of her — or of us — "Mloko," we must confess it, is a snob. She turns up her nose at whoever we may select for her; crosses but grudgingly with any other species at all; and will flatly have nothing whatever to do with our happiest choice for her attentions, *albiflora*.

With high hopes, Dr. Saunders began to cross "Mloko" on to a good many other species. He did, it is true, get a few hybrid plants. Particularly he crossed it on to *albiflora*, and got nothing. I suppose he made in all some 500 "Mloko" and *albiflora* crosses over a number of years without getting so much as one hard hybrid seed. Finally his patience came to an end and he decided on a flank attack.

Dr. E. B. White of Washington showed, as Dr. Saunders himself said, "far more determination than I." He made five hundred crosses each year for eight years, faithfully and steadfastly putting pollen of "Mloko" on to the lovely pink *albiflora* "Mons. Jules Elie," with the same results. Finally in the eighth year, he got one hard seed, which grew up and in due course came into bloom and is now on the market under the appropriately lovely name, "Claire de Lune." It has charming single flowers of pale ivory yellow, and is altogether a hybridist's triumph.

Among the happy few on which "Mloko" does cast favourable glances, are two that we have mentioned as coming from its own home grounds: *tenuifolia* and *macrophylla*. We had had "Mloko-macro" hybrids in the garden since pretty early days. Fortunately these hybrids are fertile in their first generation, so their pollen was crossed out on to

various other species. On *officinalis* it took with fair ease, producing a triple hybrid: "mloko-macro-*officinalis*." Dr. Saunders then crossed this triple hybrid on to *albiflora*, which he called his "Backstairs Method" of bringing "Mloko" and *albiflora* together. These quadruple hybrids began to come into bloom, some one hundred and twenty-five of them, in 1943, and are proving to be a beautiful and unique group of plants.

Not only is "Mloko" chary about having children at all; she is as niggardly with her pale yellow as *P. lutea* is prodigal with her gold. We have a number of different groups of hybrids in which "Mloko" has had her unwilling share, but not one of her children has ever matched her in yellow. There are pale ivory yellows, and deep cream colours, but no clear pure true yellow such as her own. Nor has she been more generous in the matter of foliage: no trace of the rounded leaf, nor of the jade-grey texture is found in later generations. The quadruples, which bloom in late May, do introduce, at least in their flowers, a new colour scheme and new texture. Predominantly pale golden-ivory with a sort of opalescent sheen, they are sometimes blended, often deeply rosy-veined; some are even brightly flared like a tree paeony. These hybrids are remarkable for great vigour and robustness. Of this strain, "Rushlight" and "Starlight," both earlier than Dr. White's "Claire de Lune," closely resemble it in colour. "Firelight" is a deep pink; "Lady Gay" is an ivory with deep bright flares.

There are, of course, many other hybrid strains from species even rarer and less well-known. *P. coriacea* gave rise to a group called the "Lavender" strain, for its flowers are a pure pale lilac shade; *P. emodi*, the little species from the Himalayas, has given us "White Innocence" and "Windflowers," all lovely plants for the garden. Still other hybrids — who knows? — may find their place of honour as ancestor of some as yet unborn and complex hybrid paeonies of the future. And in attempting to introduce my readers to some of the pitfalls in the path of the hybridist, or at least of that one hybridist whose work we have been studying, I hope I have shown too, some of the peaks—the highlights of a lifetime of happy and devoted work on the genus *Paeonia*.

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## NOTES FROM THE CHRISTCHURCH BOTANIC GARDENS

L. J. METCALF, (*Assistant Curator, Christchurch Botanic Gardens*).

The winter in Christchurch this year has been much drier than usual and from the middle of May very little rain has been recorded. In many ways this has been fortunate for not only has it enabled much outside work to be done but the soil being in a relatively dry condition has enabled the more tender plants to better withstand the fairly severe and frequent frosts which have been recorded. Borderline plants which normally just escape frost damage have been cut this year, and winter and early spring flowering trees and shrubs are a week or two weeks later in coming into flower.

In many Christchurch gardens far too little attention is paid to winter colour in the garden and many people just do not realise what a wide range of plants is available for this purpose, so in this issue it is proposed to mention some of the plants which are attractive during the winter in the Botanic Gardens.

One of the best winter displays is in the rock garden and adjacent Heath border which is planted with mainly hardy varieties of *Erica*. The main display is provided by *Erica carnea* and its varieties, and *E. x darleyensis*. One of the finest is *E. carnea* "Springwood" which smothers itself with white flowers; it is often wrongly named "Springwood White." "Springwood Pink" is a sport from the preceding and has flowers of clear pink, while "King George" with deep rosy-crimson and "Vivellii" with deep carmine-red flowers and bronzy-green foliage are both very attractive. *E. x darleyensis* is a reliable plant too well known to need description, as is *E. lusitanica* the Portuguese Tree Heath which is becoming such a pest in parts of the country. In Christchurch gardens one need have no fear of it being a nuisance and it is a good winter flowering shrub. Commencing to flower in June and continuing till late July is *E. canaliculata* (*E. melanthera* of gardens) which literally smothers itself under a cloud of bright pinkish-mauve flowers and makes a very bright corner on the Pine Mound.

At the western end of the rock garden is a fine bush of *Hamamelis mollis* and on the Archery Lawn near the Art Gallery is *H. japonica* which comes into flower a week or two later than the former. *Hamamelis mollis* commences flowering towards the end of June and carries on well into August and although the books make no mention of it, it has a delicious perfume which on a sunny day is easily discernible at some distance from the bush. *Hamamelis japonica* usually comes into flower about mid-July and with its more spreading habit of growth, smaller and deeper yellow flowers it is not quite so handsome as *H. mollis*. Also on the Archery Lawn near the Art Gallery is a specimen of *Crataegus mexicana*, a rather uncommon small tree which is practically evergreen and has conspicuous golden yellow fruits from June till August.

There are some shrubs which seem never to cease flowering and they are just as useful in the winter as in other seasons. *Eriostemon myoporoides* is one of these and there is hardly a month when it does not have some flowers. It is an attractive small bush with scented foliage and the star-shaped flowers are pink in the bud opening to pure white. In the Australian border *Correa rubra* with its scarlet and greenish-yellow flowers is always attractive throughout the winter. *C. alba* although not so showy is nevertheless a useful winter flowering shrub, and *C. backhousiana* with pendant, tubular, greenish-yellow and brown tipped flowers is another perpetual flowering species. The well known *Grevillea rosmarinifolia* needs no description and is a good hardy shrub which is always in flower, while other species which produce flowers in the winter are, *Grevillea juniperina*, somewhat like *G. rosmarinifolia* but with pale yellow flowers, and *G. williamsoni* a bushy shrub 4 to 5 feet high the

flowers of which are red with creamy tips. *Templetonia retusa* mentioned in a previous issue of "New Zealand Plants and Gardens" is another Australian shrub which usually commences flowering in July and brightens up the Australian border; however this year it is only just starting to flower now. *Hakea leucoptera* from South East Australia produces masses of pink flowers in June and July and is quite hardy. It is a similar looking species to *H. acicularis* but more attractive.

In the bog garden there are one or two plants which are not generally seen. Perhaps the most interesting is a specimen of *Sophora chrysophylla* a Hawaiian relative of the New Zealand Kowhai and with us surprisingly hardy. It has much the appearance of the New Zealand species but with larger and broader pinnae than is usual with the Kowhai, and the flowers are smaller and pale yellow. The pod is few seeded and winged. It flowers from June till about October. On the eastern side of the bog garden the Manzanita of California, *Arctostaphylos manzanita*, may be seen flowering throughout the winter. The leaves are ovate to orbicular, thick and coriaceous, and grey-green. The flowers are deep pink, shaped like Lily-of-the-Valley, and produced in terminal panicles. It is a member of the *Ericaceae* and needs a sunny well-drained position. One of its chief attractions lies in the reddish-brown peeling bark which in the late spring exposes the smooth and polished stem underneath.

Another shrub in the bog garden with attractive stems is *Rubus biflorus* which is a deciduous shrub up to 10 feet high and although not particularly outstanding over the summer is really effective in the winter. The spiny stems are covered with a thick, white waxy coating and throughout the winter it is a most effective shrub.

The ever popular Winter-sweet or *Chimonanthus praecox* is planted in several parts of the Gardens but the finest specimen is in the border in front of the tropic house. It is a large bush about 8-9 feet high and as much through, and on a sunny afternoon its fragrance may be detected quite a number of yards along the walk. From seed it is variable and the finest forms are raised from cuttings. While dealing with sweetly scented shrubs there are two species of *Lonicera* which flower in winter and have scented flowers. They are *L. fragrantissima* and *L. standishi*, two very similar species which are often confused but may be distinguished by the former being glabrous except for the margins of the young leaves, and the latter having bristles on the young shoots, flower-stalks and corolla. Both are partly evergreen, not particularly showy, but the small creamy white flowers are produced throughout the winter and are very fragrant. Also both species are native to China.

The last plant to be mentioned in this article is *Helleborus corsicus* the best of the green-flowered hellebores. It has coriaceous trifoliate leaves, coarsely toothed, and grey-green in colour. The flowers are pale green, about 2 inches across and borne in many flowered panicles. It is easily grown and flowers throughout the winter and into early spring. Although this is the end of the article, the list of plants attractive in the

winter in the Christchurch Botanic Gardens is by no means exhausted and those people who are able to visit the Gardens in winter will see numerous other examples of such plants which may be grown in Christchurch.

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## NOTEWORTHY PLANTS

### The *Michelias*

There seem to be as many fashions in garden subjects as there are in hats, and plants which are sought after avidly one season can be completely ignored in a few years. There is, however, some material which has held its place in the public interest from the time of introduction.

One of these is the "Port Wine Magnolia" or *Michelia fuscata* as it is now called and there are some fine specimens of this attractive evergreen tree in many old New Zealand gardens. Their shining compact foliage shows up well in any planting scheme and on hot summer days the profusion of small fleshy magnolia flowers gives out a sweet heady fragrance.

Although introduced into Britain in 1796 it proved to be too tender for the rigid climate. It appears to be synonymous with *Michelia figo*. This is, however, but one of a group of very attractive trees which has so far escaped general notice. There are some 45 species, mostly of a tropical nature, confined to Asia fanning out from India through China to Japan and through Malaya to Java.

They differ from the magnolias in that they are evergreen and have axillary flowers instead of carrying their blooms only on the ends of the branchlets. Although the blooms individually are smaller than magnolias, they are borne in great profusion and their perfume is generally entrancing.

*Michelia champaca* is a well-known, cultivated tree in the tropics, occurring naturally in India and Indo-China. It is widely planted in the Far East for its beautiful shining leaves and very fragrant flowers. These are solitary, deep yellow and star shaped; not unlike a double narcissus. The fragrance is too powerful for most and it is said even the bees pass them by. However, the native women delight to wear them in their hair, which seems to point to the fact that the overpowering perfume can be put to good use. This tree has been used extensively for avenue planting in Rio de Janeiro, which city seems to be unique in the world in its unusual methods of beautification. Efforts to raise this magnificent tree in New Zealand so far appear to have failed and even in Florida, where many tropical trees flourish, it has proved a hard subject.

There are two *michelias*, however, which are proving quite hardy in this country and will become popular with discriminating gardeners when they become better known. Both grow rapidly into very attractive

conical trees, the substantial foliage standing up well to adverse conditions. The soil should be well drained, but should contain a liberal proportion of organic matter to prevent drying out in the summer.

*Michelia compressa* is hardy in England and has the added advantage of flowering early in its life. Most authorities decry its tiny blooms but, although like minute *Magnolia soulangeana* flowers, they are carried in every leaf axle and are extremely fragrant. A picked branch has a particularly refined appeal but, as with many of this type of tree, its real beauty comes with maturity.

It is *Michelia doltsopa*, however, which will undoubtedly enjoy pride of place in the hearts of garden lovers. This is a temperate Himalayan variety which is hardy only in favoured parts of England, there being a fine specimen at Caerhays Castle, that home of so much of the best in the plant world. So far it seems to be hardy in New Zealand, except where very heavy frosts occur. This is indeed a plant worth waiting for, as the lucky owners of the few mature plants in New Zealand can verify. Usually it takes up to seven years to flower well, but in the meantime makes a tall, well-shaped pyramidal tree. The fragrant flowers are similar to cream water lilies, often three to four inches across, and carried in great profusion. The flower buds form in the Autumn and are attractive in themselves sheathed in golden brown fur. Blooming commences in early spring and continues for several weeks.

Although it is flowering during the time of magnolias, daffodils and camellias it will undoubtedly take its place in the front rank of worthwhile garden plants.

S. FORD,  
New Plymouth.

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## BOOK REVIEWS

DESIGNED FLORAL ARRANGEMENT, by Margaret O'Brien (A. H. and A. W. Reed, Wellington).

The art of floral arrangement in New Zealand has reached such a high standard that a work of this nature has been long overdue. Miss O'Brien has succeeded admirably with her task and has covered ground that appears so far to have been neglected in similar books published in England. The appeal is to both the housewife, who wishes to develop her skill in floral arrangement, and to the florist seeking for new ideas. The eight chapters cover a wide aspect of the art comprising a discussion of the possibilities of containers, line and mass designs, table and wall designs, dried flowers for winter use. The chapter "Colour in Plant Material" is particularly well thought out and the information given is both clear and helpful. Flower show organisers will find much that is helpful in the final chapter "Amateur Flower Arrangement Shows."

In a book of this kind the illustrations form an extremely important feature and, in view of the readers it is certain to find overseas, it is difficult to understand why the publishers did not include a good quota of coloured illustrations and have charged accordingly. The many black and white illustrations cover a wide range and are excellently chosen. Those showing the various stages of the construction of certain arrangements are particularly helpful to the beginner.

Altogether a delightful book but how much more delightful and more useful it would have been had some of the illustrations been in colour.



BROCHURE OF COLOURED ILLUSTRATIONS OF CONIFERS (Plant Publicity, Holland).

Although this publication is not offered for sale and is designed to give publicity to the various species of conifer cultivated in Holland, the excellence of its production demands attention. In all there are 33 coloured photographs covering a very representative selection of conifers. One with which I am not familiar is *Chamaecyparis lawsoniana columnaris*, of an excellent upright habit and deeply glaucous foliage that stands in bold contrast to the golden and green foliated species.

NEW ZEALAND IRIS SOCIETY, Bulletin No. 27, September, 1958 (Published by the New Zealand Iris Society Inc.).

Under the editorship of Mrs. Jean Stevens, of international fame in the Iris world, one naturally expects a publication of considerable merit. To gardeners in general and iris specialists in particular this publication cannot fail to be of considerable interest. The issue under review covers a wide range of subjects from photography of irises to collecting species in Western U.S.A. where such delightful irises as *douglasiana*, *purdyi*, *tenuissima* and others find their home. The two articles on the Louisiana irises are particularly interesting. To those of us who grew them in their very early stages of development S. E. Rix's article on modern varieties provides a valuable guide to what is best in this remarkable and lovely group. The article on propagation by E. J. Adams will interest all who wish to grow this modern development in one of our leading spring genera.

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## BI-CENTENARY OF THE ROYAL BOTANICAL GARDENS AT KEW, ENGLAND

The bi-centenary of the Royal Botanical Gardens at Kew, England will take place in 1959.

It is intended to celebrate the event by the erection of a memorial as a permanent feature of the Gardens and an appeal has been opened for this purpose. The form the memorial will take will depend on the amount contributed to the fund and no definite plans have taken shape.

The organisers of the bi-centenary celebrations wish to be provided with a list of organisations and individuals who might be interested in contributing to the memorial fund either because of a general interest in botany and horticulture or, perhaps, because of a connection with the work done at Kew.

Will likely contributors and interested persons kindly send their names to—

Mr. S. F. St. C. Duncan,

Office of the High Commissioner for the United Kingdom,  
Wellington.

The High Commissioners' Office *does not* want contributions at the present stage. The organisers will make a direct approach, in due course, to those organisations or persons who send their names.

## DISTRICT COUNCIL REPORTS

## ARBOR DAY — WELLINGTON

On Wednesday morning, 6th August, the Dominion President, Mr. John Houston, LL.B. represented the Royal New Zealand Institute of Horticulture on the occasion of Arbor Day celebrations held in Wellington. In response to an invitation to speak, Mr. Houston delivered the following address:

Our cities proclaim the progress of man, and what he has accomplished. His development in the fields of art and of science, his achievements in industry and in commerce, have been noteworthy. Much has been accomplished in this new land of ours within a space short indeed as time is measured. We are pardonably proud of that advancement, and we know that the trail of accomplishment has been hallowed by sorrow, joy and toil.

Yet we must recognise that even the least of these trees teaches to all of us the lesson of humility. Here before you is something far beyond the capabilities of even the most expert of men. No man can make a tree.

Man may plant, and he may prune. He may use trees to beautify the landscape, or to lend charm, or to give shelter to his habitations. He may use trees for timber, building thereout great ships and fine houses. He may turn them to many uses, even for firewood to keep him warm. But — no man can make a tree.

Today we plant trees to beautify an area. It is our duty and privilege to all of us the lesson of humility. Here before you is something far beyond the capabilities of even the most expert of men. No man can make a tree.

## WELLINGTON

A very happy evening was spent in the Lecture Hall of the Public Library recently, when Mr. Herbert Poole of Lower Hutt addressed members of the Wellington Horticultural Society and the Wellington District Council of the Royal New Zealand Institute of Horticulture on the subject of "House Plants."

The term "House Plants," Mr. Poole stated, includes all those plants that had been found, through the years suitable for growing in pots or containers indoors for useful interior decorations.

The modern cult of making full use of ornamental plants indoors has probably received its greatest impetus from the Continental countries (Norway, Sweden, Germany) where a large proportion of the population in the larger centres are housed in flats and apartments without any opportunities of indulging in outdoor gardening.

Although we speak of "modern" decorative plants, which fit in so nicely with modern home, office or building, it will be found that many of these plants are by no means new or difficult to cultivate but are actually old favourites revived on the new cycle of popularity. Fashions in all things change from time to time, but very few *styles* are new — the wheel has gone round again — and a new generation finds new pleasures.

Modern architecture tends to supply as much natural light as possible in our homes. This greatly encourages the use of ornamental pot plants, as natural light is one of the most important factors in plant growth. This does not mean however that all plants require exposure to full light. Some like sunshine, some like shade, and this is a point to bear in mind when purchasing your plants and consideration must be given to the position you intend your plants to occupy in the house. Light, temperature and nourishment should be in balance — cold periods of winter will call for much less watering than spring and summer.

Overwatering is probably the chief cause of failure with most pot plants — waterlogged conditions quickly cause plant roots to die, air is excluded from the soil, bacterial life ceases and the whole soil function collapses.

Proper drainage is essential — plants should not be left in saucers full of water.

Regular cleaning of indoor plants helps to keep them healthy. Occasional spraying and sponging, with a little milk in the water, will promote a nice shine on leaves without any harm. This will tend also to discourage pests but if these do occur there are ample proprietary insecticides available to combat them.

Indoor plants must have fresh air, but do not like draughts. Clay pots are preferable as they are porous and facilitate aeration of the soil. They may be used inside the more decorative plastic or glazed containers.

The introduction of the "John Innes" soil formula has greatly simplified the growing of pot plants and has ensured greater success for amateur growers. The formula is as follows, and may be used for practically all pot plants:—

Seven parts of loam, 3 parts of peat or leaf mould, 2 parts coarse sand, 1½oz. keratin, 1½oz. superphosphate, ¼oz. sulph. potash, ¼oz. lime, per bushel of mixture.

Mr. Poole then dealt with the many varieties of House Plants available, and strongly recommended the beginner to start with the simpler and easy-to-grow plants. Success and experience in caring for and growing these would fit the amateur to grow the more difficult types.

He dealt with the hanging basket varieties, flowering varieties, foliage plants, and those that would easily grow in a tumbler of water such as the ordinary Kumera whose trained foliage gave a very pleasing effect.

Following upon his talk, Mr. Poole screened a collection of coloured slides of begonias, orchids, nerines, and other exquisite and rare green house plants grown at his nursery and by Mr. C. H. Matthews of Laing's Road, Lower Hutt.

A hearty vote of thanks to Messrs. Poole and Matthews was moved by Mr. J. P. Salinger who stated that during the evening members had not only received much help and information on the growing of House Plants, but had also seen through the coloured slides what could be grown to perfection in a greenhouse.

#### *FUCHSIAS BASIS OF TALK TO WAIROA HORTICULTURAL SOCIETY*

The August meeting of the Northern Wairoa District Council of the New Zealand Institute of Horticulture was held in the Bandroom. Mr. C. C. McKavanagh presided over a good attendance.

It was decided that nominations for the election of fellows be withheld until the September meeting. A number of members of the Horticultural Society offered their services to assist the Dargaville Borough Council in street tree planting if required.

In response to a request from the Dominion office, it was decided that copies of horticultural reports published in the Northland Times be forwarded to the editor of the horticultural journal.

Correspondence from head office also requested any information on historic trees or groups of trees, such as Tane Mahuta, in the Waipoua Forest. Such information is to be forwarded to the local secretary, Mrs. E. Russell, Waihue, who will in turn forward details to the Dominion secretary for publication in the horticultural journal.

#### *Guest Speakers*

Guest speakers at the meeting were Mr. and Mrs. E. F. Petterson, from the Auckland Fuchsia Society. Mrs. Petterson spoke on the planting, manuring and pruning of fuchsias, and also demonstrated the three types of cuttings used — soft tip, hardwood and semi-hard. The speaker described her method of striking these cuttings, placing them under a glass jar and spraying them three times daily. In hot weather she also gave them a protective covering of brown paper.

Mr. Petterson delighted his audience with his showing of a number of coloured slides he had taken in the garden and grounds of their home at Howick. The section is a sloping one, providing an ideal setting for the many artistic trellises used in pleasing combination with the shrubs and garden trees and innumerable fuchsias themselves. Mr. and Mrs. Petterson have 130 different varieties of fuchsias growing in their garden and their collection includes 30 new releases obtained from America last year. A gesture keenly appreciated by the meeting was the donation of plants of some of these for sale on the trading table.

#### *Use of Punga Stumps*

A most interesting feature noted in the coloured slides was the use of stumps of black punga. Some lovely effects were achieved with bush fuchsias and those growing in punga stumps used alternatively. The punga-planted specimens presented an unusual trailing effect against the background of trellises and greenery.

The Petterson family have retired from business life and will be shortly moving from Howick to take up residence at McLeod's Bay, Whangarei. A cordial invitation was extended to members of the society to visit them and inspect their section at McLeod's Bay, both before and after they commence their gardening there.

At the conclusion of the meeting supper was served, a vote of thanks to the speakers being moved by Mr. R. Sills and carried with enthusiasm.

—Northland Times, August.

#### *HORTICULTURISTS TO CO-OPERATE WITH TREE PLANTING PLAN*

The July meeting of the Northern Wairoa District Council of the New Zealand Institute of Horticulture was held in the Bandroom, Mr. C. C. McKavanagh presiding over a good attendance.

It was decided that no action be taken regarding membership of the Pukeiti Rhododendron Trust.

Following correspondence from the Dargaville Borough Council, the meeting agreed that the committee be given power to act in proposed tree-planting in Dargaville streets. A meeting will be arranged with the horticulture committee and the chairman of the borough council's parks committee.

A decision was made to commence a plant request. Requests will be made in writing, handed to the secretary and signed by the requestee. Funds raised by this means will go to the trading table.

The speaker for the evening was Mr. F. T. Morrison, of the Waipoua State Forest, whose subject was tip cleft grafting. On behalf of the members, Mr. L. Ford thanked Mr. Morrison for travelling so far to give them the interesting address.

At the conclusion of business Mr. H. W. Gaukrodger showed a film entitled "Kew and Me," dealing with the famous Kew gardens.

—Northern Times.

#### *"WOODEN FLOWERS" MAKE UNUSUAL DISPLAY AT DARGAVILLE*

A fascinating and unusual display — "wooden flowers" — was seen at the June meeting of the Northern Wairoa District Council of the Royal New Zealand Institute of Horticulture.

The flowers were exhibited by Mr. L. Whelan, who spoke of their origin, stating that the collection had been loaned by Mrs. S. A. Grubner, of Valley Road. Mrs. Grubner had also consented to loan the flowers for a further period, and they will shortly be seen displayed in the window of Walden's Shoe Store Ltd.

The so-called "wooden flowers" are really portions of the roots of well-known forest trees and shrubs, with abnormal corrugated rosettes attached to them. These growths are caused by a root parasite, known to botanists as *dactylanthus*.

Although found in the forests of the central part of the North Island, *dactylanthus* is nowhere conspicuous as the visible parts of it are brown in colour and grow close to the ground.

The parts thus exposed are the flowering heads, each protected by close-fitting brown scales, which form cone-like cups, within which are the flash-coloured flowers. Beneath the surface of the ground these heads will be found attached to a warty tuber, which is itself fixed to the root of the host tree.

It is only when the section of the root has been cut out and the tuber removed by boiling that the "wooden flowers" are disclosed.

—Northland Times.

### HORTICULTURE AFFAIRS

The June meeting of the Northern Wairoa District Council of the Royal New Zealand Institute of Horticulture was held in the Presbyterian Hall, Mr. C. C. McKavanagh presiding over an attendance of 22.

Mrs. R. C. Tapp, Tangiteroria, spoke of her success in growing tuberous begonias out of doors. The speaker also displayed a model of the light shelter under which she grew her plants, the back and top of the construction being of scrim, to protect the blooms from the wind and direct sunlight.

Another speaker was Mrs. G. Clements, Awakino Point, who gave a report of the winter gardening school organised by the Adult Education Service, which was held in Auckland during the May school holidays. Mrs. Clements outlined the various subjects covered, both speakers being thanked for their addresses.

—Northland Times.

### SOUTH TARANAKI

Notes of interest from South Taranaki District Council Meeting:—

*Waterlilies*: to encourage free flowering, the most suitable position to choose for the pond would be one in full sun. After planting in the most suitable soil, a shingle covering, placed around each plant helps to keep it firm, and when fish inhabit the pond, prevents them from disturbing the roots and muddying the water. The worst pest is aphid. Their life cycle alternates between the plum — on which the eggs are laid — and the water lily and various other aquatics which are the summer host plants. Nicotine soap or pyrethrum extract may be applied as a contact wash in early summer, to keep the pest in check. No wash containing derris should be used as it is poisonous to fish.

Mr. R. Syme, using branches from the various shrubs and trees, gave a most interesting talk and demonstration on pruning. Apple, peach, Chinese gooseberry, cranberry, raspberry, feijoa, gooseberries (red and white) and black currant were the chief kinds in use. The difference between the black currant and the red and the white currants, is worthy of note. The black need liberal manuring in autumn or early spring. The fruit can be borne on spurs, but it is less abundant and smaller than those formed on the strong shoots of the previous year. Pruning therefore is directed towards the production of strong shoots from the base of the bush. Remove all old wood as soon as the fruit is picked. If there are not enough new basal shoots, cut the old shoots back to strong new laterals. Red and white currants are not particular as to soil, so long as drainage is good and potash present. These bushes produce their fruit on spurs on the old wood. Leaders should be pruned back in autumn to a sound bud. The centre of the bush should be kept open.

Specimens from the display tables were examined and discussed. *Vallota purpurea*; *Sapium sebiferum*; *Lambertia formosa*; *Tricyrtis hirta* or Toad Lily, were among the most interesting.

*Vallota purpurea* or *speciosa* is commonly called Scarborough Lily. This has caused much confusion at shows where collections of lilies are entered in a class. The vallota belongs to the *Amaryllidaceae*. One way to distinguish an amaryllis from a lily, is to look for the ovary. In the lily the ovary is superior, that is it is above the perianth. In the amaryllis the ovary is inferior, conspicuous

below the perianth. The vallota is a native of South Africa. It needs a compost of leafsoil and sand in equal parts. Once planted do not disturb for years.

*Sapium sebiferum*, is the only ornamental species of the genus, natives of tropical regions, natural order *Euphorbiaceae*. *Sapium jenmani* grown in British Guiana is an important source of rubber there.

*Lambertia formosa* (*Proteaceae*), is one of about 11 species of a genus of shrubs confined to Australia. The leaves of this evergreen are in whorls of 3, are entire, rigid, 1-2in. long,  $\frac{1}{8}$ - $\frac{1}{4}$ in. wide, with a spine-like tip. The red, erect flowers,  $1\frac{1}{2}$ in. long, are in a group of 7in. a terminal cluster subtended by an involucre of coloured bracts. The perianth is elongated, tubular, 4 lobed. On account of the peculiar hard horned seed box, 2 to each cluster usually, the plant is known as the "Devil Bush."

*Tricyrtis hirta* or Toad Lily (*Liliaceae*) was much admired. The stem about 18in. long covered with pale purple spotted flowers, each about 1in. long, grows from shortly creeping rhizomes. It is a perennial, native of China and Japan.

—Mrs. J. H. ANDERSON, F.R.N.Z.I.H.

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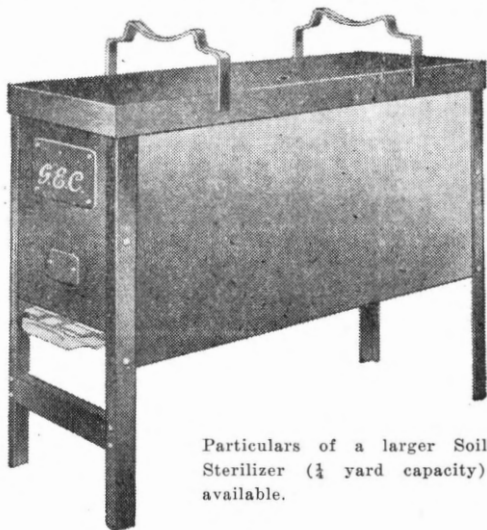
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**PUBLICATIONS ANNOUNCEMENT**

A revised edition of the late Dr. H. H. Allan's work on "Historic Trees in New Zealand" (published 1941) is under preparation by the Institute in readiness for publication at an early date.

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**NELSON:** Mr. Dennis H. Leigh, F.R.I.H.(N.Z.), Reserves Department, Nelson.  
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**SOUTH CANTERBURY:** Mr. A. W. Anderson, N.D.H.(N.Z.), P.O. Box 153, Timaru.  
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3. To assist and promote horticultural education in every way possible.
4. To promote legislation having for its objects the advancement or protection of horticulture.
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8. To undertake or assist in the introduction and acclimatisation of any fruit tree, flowering tree or plant, forest tree, seeds or other form of plant life which, in the opinion of the Institute, should be introduced.
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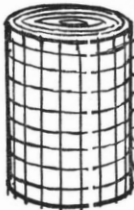
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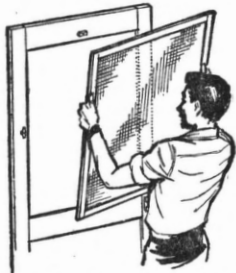
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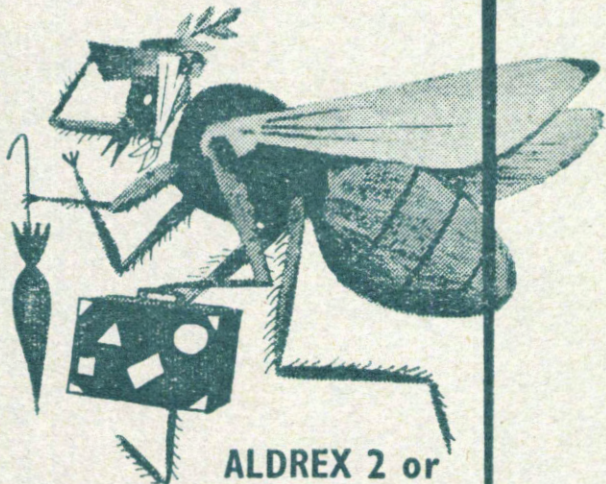
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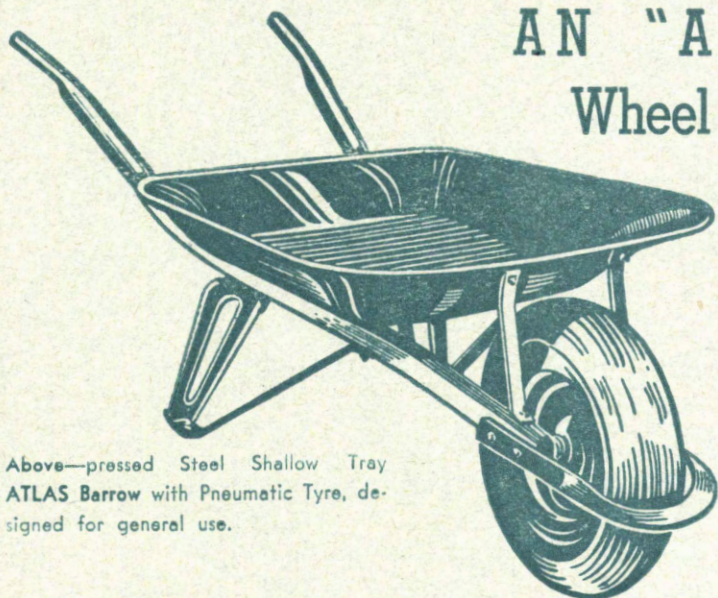


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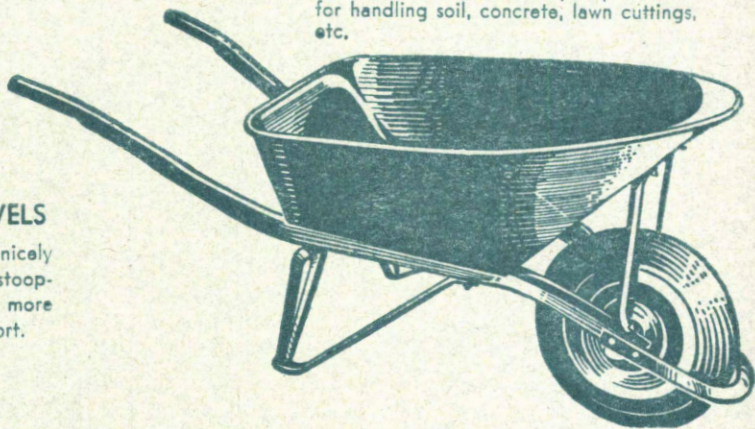
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