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NEW ZEALAND PLANTS AND GARDENS

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NEW ZEALAND PLANTS AND GARDENS

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

Volume VI. DECEMBER, 1964. No. I

GREETINGS

Christmas is a time which most of us in New Zealand regard as a very special day in our calendar. It is a time when many of us realise that we have strayed far from the path marked out for us to follow by Him who was born 1,964 years ago.

With Christmas drawing near we suddenly become aware of the many things we have not done and the many friends we have not contacted during the year. Your President is no exception in this regard and I only wish that it had been possible for me to visit all District Councils and to have seen many of you personally.

We in this country have much to be thankful for. Ours is certainly one of the favoured lands with a fertile soil and wonderful climate. We who are connected with Horticulture, be we amateurs or professionals, certainly have our disappointments, but we all have many rewarding results for our labours.

Horticulture has a great future in New Zealand and it is pleasing to note that, not only can we give assistance in our local areas but collectively through our Dominion Council we can give a helping hand nationally.

It gives me much pleasure, on behalf of the Dominion Council, our Secretary and myself to wish you all a Happy Christmas and a bright and prosperous New Year.

J. F. LIVING,

Dominion President.

MODERN VERSIONS OF SOME OLD GARDEN FAVOURITES

NANCY STEEN (Auckland)

Fashions in flowers change just as they do in all other things. We live in a time of marvellous innovations—in plants as well as in science. Artificial pollination, combined with intensive research programmes and the help provided by tests carried out in trial grounds, has quite transformed our gardens. Plants with larger blooms and spectacular colouring appear with great regularity; but, in the less formal parts of a garden, there is still a place for some of the older garden favourites, for many of them have great individuality. A garden cannot stand still—it must go forward or back, and half the enjoyment is in experiment, and in trying out new groupings of plants, whether they be old or new. Harmonious trees, shrubs and perennials can create a restful effect, even in a small area.

A plant that has made a spectacular return as a garden favourite is the *Fuchsia.* After having enjoyed great popularity in Queen Victoria's reign, it suffered a decline later when small, bedding-out plants became fashionable. The earliest hybrid fuchsias could cost as much as a guinea a plant, and all were bred from the many wild types introduced from the West Indies, and Central and South America. *Fuchsia magellanica* and its varieties *gracilis, gracilis* 'Variegata' and 'Pumila', though commonplace plants, in the right environment often give a better effect than a rarity struggling for existence. All are familiar in New Zealand as is an early hybrid, the tall 'Riccartonii'. These hardy fuchsias were an amazing sight in Ireand where they adorned the walls of whitewashed cottages and formed vast hedges. The compact, dwarf 'Tom Thumb' is a choice and very old *magellanica* hybrid which makes a splendid rock garden subject. It smothers itself for months on end with fat flowers of light crimson and mauve, and is a decided acquisition, being far more showy than its dwarf relative, *Fuchsia m.* 'Pumila'. *Fuchsia arborescens* from Mexico, and the Peruvian *Fuchsia serratifolia,* are both fine garden plants, but may be tender further south, while our own *Fuchsia procumbens* is useful for draping over low rock walls. However, it was not until the first large flowered hybrids were produced fairly early in the last century that the real *Fuchsia* craze began and continued for a considerable period. Until 1842, all fuchsias produced flowers in tones of red and purple, but, in that year, a chance seedling from *Fuchsia* 'Riccartonii' turned out to have white sepals. This *Fuchsia* was named 'Venus Victrix' and caused a sensation. The breeders of those days got to work quickly as they were thrilled with its great possibilities. The first striped *Fuchsia,* 'Bland's New Striped', appeared in 1872; and, in this garden, a modern descendant, 'Lucky Strike', makes a good companion plant for old striped roses. None of these earlier hybrids are now in our garden, with the exception of variegated leaved 'Sunray'; but until a few years ago we did grow 'Rose of Castile', 'Ballet Girl' and 'Avalanche'. Now we concentrate

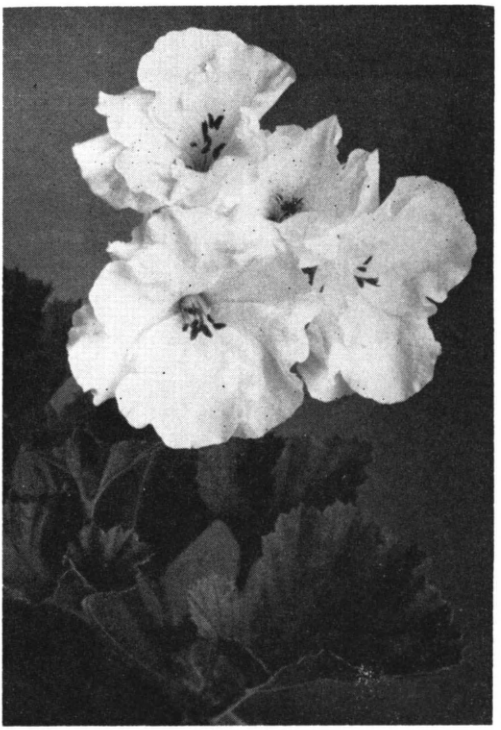
on the fine new hybrids available in ever increasing numbers. The ones bred in America are particularly successful here and we are delighted with many of the white or white and pink varieties, which though they look pale and delicate, need no coddling in our frost-free garden. Some are very tall growers like 'Whitemost' which covers three sides of a wide chimney and reaches up to the eaves of the house. It blooms freely for many months and is a grand sight. 'Sleigh Bells', 'Flying Cloud' and 'Barbara Mathews', three white-flowered varieties, all grow freely, while the white and pink-toned 'Waltztime', 'White Spider', and 'Shy Lady' are all lovely. 'Boudoir', with its full flowers of white and bluish-lavender, grows beneath the smoky-lavender rose, 'Veilchenblau', and is always admired. Modern fuchsias come in a lovely range of colour, and many have large and very beautiful flowers. 'Flirtation', 'Pastel', 'Pink Quartette', 'Azalea' and 'New Horizon' favour the pink, rose and lavender tonings, while richness is added to the garden scene by the introduction of some of the deeper-toned varieties. Useful fuchsias in this colour group are 'Dusky Rose', 'General Montgomery', 'Midnight Sun', 'Wave of Life' (with golden foliage), 'Violet Gem' and 'Othello'. It is hard to believe that these modern fuchsias are descended from the wild types introduced from Central and South America; and stranger still, they are all at home in our garden, and all invaluable plants.

Fashion has turned full circle with pelargoniums as well as fuchsias for these fine and extremely showy plants are well to the fore again. Their first great development was early in the nineteenth century, though none of the vivid scarlets so noticeable in Edwardian days were available then. All the plants popularly called 'geraniums' were really pelargoniums, the true geraniums hailing, for the most part, from the Northern Hemisphere, with the exception of a few species native to Australia and New Zealand. On the other hand, South Africa was the home of many of the wild pelargoniums, that were introduced into Europe in the eighteenth century. These plants were not as hardy as the true geraniums, and required to be taken indoors in the winter, unless grown in hot districts round the Mediterranean, where they really flourished and made a gay and lavish display for many months. Pelargoniums are divided into four main sections—the scented-leaved species and their hybrids; the Ivy-leaved, suitable for trailing over banks or out of urns; the Zonal, with globular heads of bloom and rounded leaves, these leaves often marked with a zone of deeper colouring; and the Regal, with divided, wavy leaves and looser heads of flowers. The richly scented old garden favourites, *Pelargonium crispum, P. fragrans, P. odoratissima* and *P. tomentosa* still find a place amongst other older plants, as most of them have unusual leaves. The Ivy-leaved pelargoniums, bred from *P. peltatum,* are lovely cascading out of urns or over banks—they are definitely trailers; but they will climb as we have found with the double white variety, 'Candeur', which has romped up through a green trellis fence and old white climbing roses.

For a hot, dry spot, the small-leaved, pink-edged, Ivy-leaved *Pelargonium* 'L'Elegante', is a treasure. The colouring is much better when the soil is not too rich. When the Ivy-leaved and Zonal varieties were crossed later, many fine plants were produced in a colour range of pinks, mauves, cerise and purples. 'Achievement', salmon, 'Col. Baden-Powell', bluish lilac, and 'Galilee', pink, are all old favourites. The zonals, mostly used as bedding or pot plants, are by far the largest group in this family, and amongst their number are to be found the highly decorative tricolours, as well as the bronze-leaved, golden-leaved and silver-leaved varieties. Many of these are used extensively as bedding or edging plants in parks and gardens. The rather brash scarlet zonal 'Paul Crampel' we have never grown, though it can look most effective growing in a tub or window box in front of a white wall; but 'Salmon Crampel' was an old favourite as was the dainty 'Dryden', with its pink flowers flushed with white at the centre and outer edges of the petals. However, it is amongst the regals that most emphasis is placed these days, for breeders are producing some magnificent varieties in a wide colour range. We grow these plants in full sun alongside the tennis court where, with the support of the wire-netting fence, they climb and spray out towards the sun. A hundred years ago gardeners were prepared to pay one pound for a new *Pelargonium*—not so today in spite of the great improvement in these showy and hardy plants. Some of our favourites are 'Grand Slam', 'Easter Bonnet', 'Dawn', 'Her Majesty', 'Bridesmaid', 'Rose Queen', 'Mrs. Gill', 'Dorothy', and 'Purple Emperor'—all these have magnificent flowers that last extremely well when cut, the individual blooms of these modern plants being almost twice as large as those on the early regal pelargoniums that are still to be found in old cemeteries, such as the one at Tararu, high up on a hillside above the Firth of Thames. Here we found a scented variety with blush-white flowers heavily blotched with rose on the upper petals, the lower ones being veined with maroon.

In *The Scented Garden,* by Eleanor Sinclair Rhode, this authoress describes the primrose and the polyanthus as being of true British stock. These heralds of spring have been favourite garden flowers for over three centuries in the British Isles and, towards the end of the eighteenth century, auricula and polyanthus shows were as common as rose shows today. We have found to our cost that the old *Primula vulgaris,* the common primrose of the English hedgerows, does not flourish or flower as freely in our northern garden as it did in a southern one where red and yellow Dusty Millers—garden forms of *Primula auricula*—the Yellow Cowslip, *Primula officinalis,* and even the gold laced polyanthus—a rarity indeed these days—grew splendidly, and delighted our childish hearts, as did a border of the old double red form of *Paeonia officinalis.* Many years ago we had a few plants of the single blue, yellow-eyed *Primula formosum* which grows so well in Ireland; but did not succeed with it. The plants flowered for one year, after coming from the south, and then pined away. Double

primroses, white, lavender and red, have sulked in our semi-tropical garden, in spite of special care—though they also did well in Southland; and, from what we have heard, they do better in the soft moist Irish climate and parts of western Scotland than they do in England. All these older plants, when they thrive, look better in a semi-woodland setting. However, we have managed to keep the old Jack-in-the-Green polyanthus and grow it beneath the old roses. The flower in our plant is red, and this is set attractively in a ruff or frilled sleeve of green. The old Hose-in-Hose, with its two duplicate flowers of the same colour, is not often seen these days. This unusual plant and Jack-in-the-Green are descendants of the cowslips and the oxslips. Fortunately for us, as we have been so unsuccessful in Auckland with many of these old rarieties, the modern polyanthus, both English and American strains, have proved a great joy, flowering as they do in winter and spring.



Regal Pelargonium (white)

(see page 3)

(photograph Sparrow Industrial Pictures Ltd.)

Given a rich soil, they produce splendid heads of large flowers which last almost as well indoors as they do in the garden. There is a splendid pure white for the white garden, the blue and pink shades are admirable plants in an intimate old rose and fuchsia garden, and the clear yellows make a cheerful border near blue toned flowers. We find we obtain better results from young plants grown from seed each year,

as it is difficult in Auckland, without a shade house, to tide them over the hottest months. From this it will be seen that, though the older forms of the *Fuchsia* and the *Pelargonium* thrive in the garden, the older primroses and polyanthus have not been as successful here as they were further south, though, where they grow well, they are still charming garden plants.

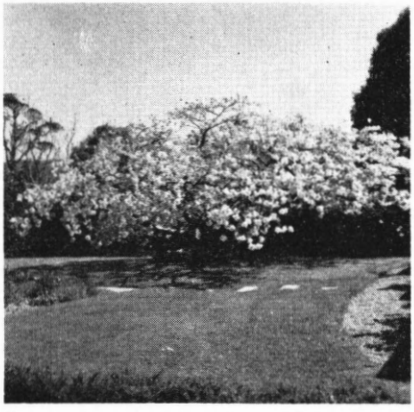
JAPANESE FLOWERING CHERRIES

J. P. SALINGER (Horticulture Division, Wellington).

Those of us who come from cooler parts of the world always looked on flowering cherries as some of the loveliest of spring flowering trees, bringing a wealth of flower after the drabness of winter.

Here in New Zealand, our gardens can be brightened by trees and shrubs throughout the year, so the Japanese cherries are less important in most part of the Dominion.

In general these plants flower best after a winter chilling period and, to my mind, they are not suited to areas which have a mild winter, or which suffer from spring gales. Despite this they are still planted in such areas, and then often succumb in a few years to Silver Leaf disease, or in windy situations become tattered and torn and wind bent. In more protected or colder areas they flourish well, and I can recall a beautiful specimen of the tree called *Prunus* 'J. H. Veitch' but probably 'Kanzan' in Victoria Park, Waimate, and a tree of *P.*



Prunus 'Mount Fuji', Upper Hutt, 45 years old

(see page 6)

'Mount Fuji' now 45 years old in a garden in Upper Hutt. At Glenfalloch they happily blend with rhododendrons, azaleas and maples, while at Palmerston North, Cherry Blossom time is celebrated at the peak of flowering of these trees in the Esplanade. Regretfully I have also noticed the planting of a spreading variety with short trunks close to the roadside in Canterbury, where their maintenance will be a continuing problem.

During their many years of cultivation, both in Europe and here, a range of varieties have been introduced often under synonyms or even incorrectly named. The most reliable works are by Miyoshi, published in Japanese, although there is a German translation and it would be most valuable to know if there are any copies of these books in New Zealand. Collingwood Ingram in his book *Ornamental Cherries* and in the *Supplement to the Royal Horticultural Society's Dictionary of Gardening* has classified them according to flower colour, but with due deference to this world authority, I have found it difficult to identify varieties from this classification, partly because varieties flower at different times and also in many of them the flower colour changes from bud to full flower; therefore to identify a variety it is necessary to watch the flower developing continuously, not always an easy task.

To overcome this I have devised a different type of key based on the two standard characters of tree shape and comparative time of flowering, to a lesser extent the type of flower, whether single, semi-double or fully double will also assist, while flower colour is of lesser significance.

I was interested to find that a Dutch authority on trees and shrubs, Dr. B. K. Boom in *Nederlandse Dendrologie,* also referred to tree shape in his descriptions.

Within this key I have tried to include all varieties of Japanese Flowering Cherries, being cultivars of *Prunus serrulata* (Lindley), which are currently catalogued and grown in New Zealand. I have also included *P. yedoensis* (Matsumara), the Yoshino cherry which is closely related to this group. It is possible that there are in the Dominion, particularly in Christchurch, varieties imported direct from Japan that have never been named or described. In Hawera several seedling varieties have also been raised and not yet named or described.

I have purposely omitted flowering cherries which are quite distinct from this species such as *P. avium, P. subhirtella,* etc.

To complete the story I would have liked to include detailed descriptions of each variety but this can only be done by studying a reference collection of them all. Regretfully I know of no such collection within New Zealand. However, the keen observer by reading the literature referred to earlier, and noting details such as compactness of flower truss, length of flower stalks, whether or not the petals are cut and the colour of the young developing leaves, should be able to confirm their identity.

This key is therefore offered to assist gardeners and nurserymen in correctly identifying the varieties they grow.

I shall be pleased to receive comments on this key and names and descriptions of varieties not yet included.

I wish to acknowledge the assistance I have received from various nurserymen in New Zealand and also from Miss M. F. Mountain of England who originally prepared the key in the *R.H.S. Dictionary.*

KEY TO JAPANESE FLOWERING CHERRIES IN NEW ZEALAND

(Cultivars of *Prunus serrulata* Lindley)

Growth Habit	Time of Flowering	Variety	Type of Flower	Colour	Remarks
Vertical	Late-Midseason	'Amanogowa'	Semidouble	Pale Pink to white	The 'Lombardy Poplar' cherry. Young foliage yellow bronze.
Upright Vase	Early to Midseason	'Hizakura' (syn. Hisakura') (Possibly 'Choshu-Hizakura' of Miyoshi)	Single	Rose Pink	Upright, but loose habit, young foliage green, but colours in autumn. Overseas 'Hizakura' is considered a synonym of 'Kanzan'.
	Midseason	'Hillieri'	Single	Pale Pink	Small tree, leaves and carpels slightly hairy.
	Midseason	'Takasago' (syn. *P.* 'Sieboldii')	Semidouble	Pale Pink	Small tree, hairs on foliage and receptacle.
	Midseason	'Tai-Haku'	Single	White	The Great White Cherry. Very vigorous, young foliage rich coppery-red.
	Midseason to late	'Kanzan' (syn. 'Sekiyama')	Double	Deep Rose Pink	Upright when young, tends to widen with age. Young foliage bronze. Many trees earlier called 'J. H. Veitch' or 'Fugenzo' are this variety.
Wide Vased (Upright broadcrowned)	Early to Midseason	'Hokusai'	Semidouble	Pale Pink	Young leaves brownish bronze, tends to be upright-vase when young, spreading with age. Incorrectly considered 'Ojochin'.
	Midseason	'Yedo-Zakura'	Semidouble	Rich Shell Pink when open	Moderate vigour. Young foliage copper.

Growth Habit	Time of Flowering	Variety	Type of Flower	Colour	Remarks
	Midseason	'Pink Perfection'	Double	Deep Rose Pink	Vigorous, very floriferous, young foliage green. A very attractive variety.
	Midseason to late	'Ichiyo'	Semidouble	Pale Pink	Long stalked flowers. Leafy carpels develop in slightly frilled flowers.
	Late	'Ojochin'	Single	Pale Pink	Strong coarse growth. Young foliage greenish.
	Late	'Shirofugen'	Double	White turning to purple pink	Vigorous. Long stalked trusses. Young foliage copper.
Widespreading	Very early	'Yoshino' (*P. yedoensis* Mats.)	Single	White to soft pink	The Cherry of Ashington D.C. Branches intertwine and brittle.
	Early	'Mount Fuji' (syn. 'Shirotae', 'Kojima')	Double	White	Matures to a very spreading tree.
	Early to Midseason	'Ukon' (*not* 'Yukon')	Semidouble	Greenish Yellow	Flowers change colour as they mature.
	Late	'Fugenzo' (syn. 'J. H. Veitch')	Double	Rose Pink	Small tree, thin crossing branches. The true variety is rare in New Zealand.
	Very Late	'Shimidsu Zakura' (syn. 'Asahi Botan' 'Oku-Miyako')	Semidouble	Pale Pink to White	Small growing tree. Flowers fade in colour as they mature. Young foliage green.
Weeping	Midseason	'Shidare-Zakura' (syn. 'Cheal's Weeping Cherry')	Double	Deep Pink	Vigorous growth for a weeping tree. Flowers frilled.

ORIGINS OF OUR GARDEN PLANTS (1)

W. R. SYKES (Christchurch).

It is obvious to even a casual observer that gardens are a prominent feature of practically all areas of settlement in New Zealand. Records show that the early European settlers were not long in making gardens, domains, parks, etc. To such people the cultivation of plants which reminded them of their homeland was important. Vegetables and fruits were naturally brought in from the beginning; something the Maoris did as well, of course. Since the days of those early European settlements in the first half of the nineteenth century, there has been an almost constant stream of plant introduction to all parts of the country from many areas of the world, until today we find that an enormous number of plant species are cultivated. The majority of these are valued for purely aesthetic reasons. It is often true that in horticulture, as well as in other fields, a prophet is not without honour, save within his own country; hence we find that New Zealand native plants have been neglected in the past. However, there are signs of an apparent trend towards a greater appreciation of such plants, although the more spectacular nature of many exotics will undoubtedly ensure their continued dominance.

It is my purpose in this article to review the main origins of this great assemblage of cultivated exotic plants, which I estimate to outnumber the native New Zealand vascular plant flora by several times. For the purposes of this brief survey I propose to exclude the great number of tropical plants cultivated in the heated glasshouses of our botanic gardens, parks and nurseries. Many of these are tropical rain forest species, of which some of the toughest have become popular as house plants. Often these may be scarcely tropical, e.g. some species of *Ficus, Philodendron, Maranta* and various gesneriads. Therefore I am confining my attention to plants which can tolerate our climate in one part of the country or another.

To state that the whole of New Zealand has a temperate climate may seem like asking for trouble. Yet, geographically, New Zealand lies entirely within the temperate zone, except for the colder high country areas, mainly to be found in the South Island, where very few people live anyway. This means that we can expect to find that the majority of our exotic garden plants come from the temperate regions of the world. Geographers have subdivided this huge region, which in the northern hemisphere includes much of North America, Asia and most of Europe, into cold, cool and warm zones. It is well-known that gardeners are always trying to grow plants which theoretically ought not to survive, but somehow often do, so that in the warmer areas of the North Island especially, a number of sub-tropical species may be seen. Conversely, others persevere with alpine and arctic plants which are often just as difficult to grow, if not more so. Also, it should

be remembered that a large number of plants have been modified by selection and hybridisation in cultivation both here and overseas, so that the host of cultivars now present often have little resemblance to the original plants growing wild in some other part of the world.

The mainstream of European settlement was from Great Britain. Thus it was to be expected that many British plants would be introduced. The common broom and ubiquitous gorse are obvious examples, each being far more common in New Zealand now than in its homeland. Trees such as *Quercus robur* (English oak), *Fagus sylvatica* (English beech), *Fraxinus excelsior* (common ash), *Tilia europaea* (lime), *Betula pendula* (silver birch), *Alnus glutinosa* (alder), *Acer pseudoplatanus,* (sycamore) were all introduced successfully, particularly the last-named, which often ranks as a weed now. From Britain came such common hardy fruits as plum, cherry, apple, pear, raspberry, currants, etc., although certain cultivars of these came via such countries as Australia. Nearly all the above-named species are really part of the old cool temperate deciduous forest flora which once covered much of Europe before the advance of civilisation. Silver birch and such trees as ordinary larch, *Larix decidua,* are better represented in the cold temperate forests of North Europe and Russia. Species from this flora are generally not nearly so much in evidence in New Zealand gardens. However, two other species are the herbaceous *Iris sibirica* and *Bergenia crassifolia.*

In Britain arctic and alpine plants are only present on isolated mountain complexes and are nearly always outliers of a more widespread flora found in arctic regions and in the European and Asian mountains. Examples seen in South Island rock gardens especially are several *Saxifraga* species, *Gentiana verna, Primula farinosa, Silene acaulis, Dryas octopetala,* etc.

Some of our common or well-known alpines are European species which are restricted to the mountains of Europe from the Pyrenees eastward. Examples are, *Gentiana acaulis, Leontopodium alpinum* (eidelweiss), *Primula auricula* (auricula), *Linaria alpina, Daphne cneorum* and the delicate little *Soldanella* species.

The upland moors and hillsides covered with heaths, particularly *Calluna vulgaris,* are such well known features of parts of Britain and West Europe, but it is worth noting that these plants are actually part of the cool temperate West European or Atlantic flora like the gorse.

Many familiar British garden plants are not really natives of Britain but were brought in from other countries at some time in the past. A large number came from cool temperate Eastern Asia and include some of our best-known ornamental shrubs. One has only to think of such Chinese plants as *Forsythia suspensa, Wisteria sinensis, Paeonia suffruticosa, Ginkgo biloba* and many of the best-known species of *Deutzia, Ligustrum, Rosa, Daphne, Salix, Hosta* (syn. *Funkia*),

Hemerocallis and the species of *Chrysanthemum* concerned with the artificial developments of the popular herbaceous types. These are but a few of the hardy Chinese plants which were being cultivated in Europe at the time of the main period of European settlement in New Zealand, and consequently they found their way to this country via Europe. A number of long-established Japanese plants also must have been brought to New Zealand early on in the same way, e.g. *Camellia japonica, Chaenomeles speciosa* (Japonica of gardeners), *Aucuba japonica, Lonicera japonica* (often a weed now), *Acer palmatum,* and species of such genera as *Prunus,* including the best-known flowering cherries, *Spiraea, Iris, Lilium* and several popular conifers, particularly *Cryptomeria japonica* and *Chamaecyparis obtusa.*

It was not until the beginning of this century that the vast wealth of western China and the adjacent territories began to reach New Zealand in any quantity. Today one could compile a long list, especially of woody plants, many of them readily identifiable by the names which frequently commemorate the collectors who went into this plant paradise. This is the country of Franchet, Delavay, Henry, Forrest, Rock, Wilson, Farrer, Kingdon-Ward, etc. Now one meets these plants almost anywhere in New Zealand. They include *Lilium regale, Gentiana sino-ornata, Buddleia davidii, Osmanthus delavayi, Stranvaesia davidiana, Mahonia lomariifolia, Cotoneaster wardii,* and many species of *Rhododendron, Primula, Syringa* and *Viburnum.* The cool temperate flora of the Himalaya is continuous with these regions of western China, Tibet and Upper Burma and has much in common with them. It has yielded a stream of garden plants since the early part of last century. Thus we find today that *Rhododendron arboreum* (introduced over 100 years ago to Canterbury), *Jasminum humile, Cotoneaster frigida, Clematis montana, Potentilla nepalensis* and the rampant *Leycesteria formosa,* are among those species which have been part of the New Zealand horticultural scene for a long time. Many Himalayan plants are difficult to grow in this country, however, mainly because of the lack of a dry winter and a monsoon-type growing season. This means that most of the attractive alpines such as *Polygonum, Primula, Meconopsis* and *Gentiana* species are rarely seen.

Turning to North America we find that the cool temperate regions have many parallels with those of Eurasia. Again, a number of species were already in Britain as garden plants before the European settlement of New Zealand, whilst others, especially from the West, were introduced later. Well-known plants of long-standing in our parks and gardens include *Liriodendron tulipifera* (tulip tree), *Liquidambar styraciflua, Amelanchier canadensis, Quercus palustris* and other pin oaks, *Robinia pseudoacacia,* as well as such well-known herbaceous plants as species of *Aster* (Michaelmas Daisy), *Solidago* (Goldenrod), *Helianthus* (perennial sunflowers), *Erigeron, Coreopsis, Phlox, Heuchera* and *Trillium.* The last two herbs are woodland plants but the others mostly originate from

the more open prairies. The equivalent climatic regions of the Rockies and Pacific coast regions have given us such beautiful herbaceous plants as species of *Calochortus, Brodiaea, Erythronium* (most of the New Zealand cultivated ones), *Lilium, Sidalcea* and *Penstemon.* Among the woody plants *Arbutus menziesii* and *Cornus nuttallii* are especially noteworthy, and it is from this region, particularly in the mountain chains stretching from Alaska to Mexico, that many of our best-known conifers come. Included here are *Chamaecyparis lawsoniana* (Lawson's Cypress), *Thuja plicata, Abies grandis, Abies concolor, Picea pungens* (Colorado Spruce; the blue 'Glauca' is mainly grown), a number of pines, and last but not least, the two giant redwoods *Sequoia sempervirens* and *Sequoiadendron giganteum* (*Wellingtonia*).

In the Southern Hemisphere, apart from some of the cooler areas of this country, especially in and around the Southern Alps, we have to look mainly to the southern tip of South America for cool temperate plants. From here come *Berberis darwinii* and several other evergreen barberries, some escallonias, *Fuchsia magellanica, Pernettya mucronata, Crinodendron hookerianum* (syn. *Tricuspidaria lanceolata*) and the fiery red *Embothrium coccineum.* In actual fact these species mostly come from the wetter Chilean side of the southern Andes and this is why such areas as Canterbury are often too dry for them to grow at their best. In Australia the plants of the high country of Tasmania, Victoria and New South Wales could be classed in this category, but most of our commonly cultivated Australian natives are from warmer areas. *Eucalyptus gunnii, Grevillea alpina,* and *Acacia dealbata* (some forms) grow in the mountains of Tasmania and are quite common in the South Island especially.

There are several widely separated parts of the world which have a warm temperate climate of the so-called Mediterranean type. These regions have contributed greatly to our gardens, and it is interesting to see how well many of them grow here, reputably often better than in their natural habitats. This is in spite of the fact that New Zealand is not generally recognised as having this Mediterranean climatic type, i.e. with mild/wet winters and hot/dry summers. The Mediterranean region obviously gives its name to this type of climate, but much of California, the central part of Chile, the south-west Cape of Good Hope region, and two areas of Australia (the south-western tip around Perth and western Victoria plus the adjacent part of South Australia), also have this type of climate. From the Mediterranean proper come many of our culinary herbs, as well as other plants which probably came via Britain, e.g. *Myrtus communis;* even called English Myrtle sometimes. Other well-known ornamentals are *Nerium oleander, Cercis siliquastrum* (Judas tree), *Spartium junceum* (Spanish Broom), *Phlomis fruticosa,* all the *Cistus* species in New Zealand, various species of *Dianthus, Crocus, Tulipa, Anemone* (the popular florists' anemones

are developed from East Mediterranean species), *Hyacinthus,* most *Colchicum* species, and several well-known *Iris* species such as *Iris unguicularis* (syn. *I. stylosa*) from Algeria.

Space does not permit me to do justice to the many ornamentals from this part of the world but before moving on, I must mention some important economic plants which have their origin here. Probably *Vitis vinifera,* the common grape, is the most important in New Zealand, but other representatives are *Olea europaea* (olive), *Ficus carica* (fig), *Punica granatum* (pomegranate), *Mespilus germanica* (medlar).

From California come such plants as *Ceanothus* (nearly all the species), *Romneya coulteri, Eschscholtzia californica,* so common on some Canterbury river beds now; as well as annuals like species of *Gilia, Nemophila* and *Limnanthes.* The Southern Hemisphere regions of this type have been a very prolific source of garden plants in recent years with the exception of the Chilean one, although certain species such as *Maytenus boaria* (Mayten) do originate from there, whilst the well-known Pepper tree *Schinus molle,* has a range extending from Central Chile to Peru. The Andes generally have given us quite a wide range of plants. However, this mountain region as a whole embraces a wide variation of climates, not only from the obvious one resulting from a wide range of altitudes, but also from variations in the seasonal distribution and amount of precipitation. Thus, proceeding north from the Mediterranean climatic belt of mid Chile, we find an important centre of origin for cultivated plants in Peru and Ecuador at proportionally higher altitudes in the majority of cases. This region tends to have a climate showing a summer rainfall maximum and thus more like the monsoonal climates dealt with below. Checking up upon contributions from this part of the Andes has shown me how many of them belong to advanced families of dicotyledons. Outstanding here is the family *Solanaceae.* In addition to many *Solanum* species, including the potato and tomato, are some shrubby *Datura* species, *Nicandra physaloides, Streptosolen jamesonii, Iochroma* species, *Fabiana imbricata, Physalis peruviana* (Cape Gooseberry), and a number of *Nicotiana* species, probably including *Nicotiana tabacum* (tobacco). In the *Scrophulariaceae* there are *Calceolaria* and *Alonsoa.* Representatives of other families include *Heliotropium arborescens* (heliotrope), *Mirabilis jalapa, Cantua* species, *Tropaeolum* species and moncotyledons such as *Bomarea* and *Hymenocallis.*

From the South-West Cape district of South Africa have come a very large number of plants in recent years and the flow of *Proteaceae* and *Erica* species amongst others is still continuing into New Zealand. Other colourful shrubs may be seen in the genera *Adenandra, Coleonema, Euryops, Podalyria* and *Polygala,* to name only a few. A large number of gay composites originate here, e.g. *Arctotis, Dimorphotheca,*

Euryops, Gazania, Ursinia, etc. We are also indebted to this part of South Africa for many bulbous and cormous plants, some of the chief genera being *Agapanthus, Babiana, Freesia, Ixia, Kniphofia, Lachenalia, Nerine* and *Watsonia.* A very good example of this flora which is so much at home over much of New Zealand is *Zantedeschia aethiopica* (Arum Lily). A large number of these South African plants were being grown in British glasshouses early in the nineteenth century, but it appears that many died out. Thus, our stocks have often been derived since then directly from South Africa. The south-western corner of Australia has a very rich and colourful flora and it is from here that the most colourful *Banksia, Hakea* and *Dryandra* species come, to mention only the chief genera of the *Proteaceae.* The majority of the spectacular mytaceous species seen in New Zealand grow in this region, e.g. in the genera *Beaufortia, Callistemon* (some species), *Calothamnus, Kunzea* (some species), *Melaleuca* (the finest species), and the famous *Eucalyptus ficifolia.* A selection from other families includes *Leschenaultia biloba, Albizzia lophantha,* a weed in the North Island, *Boronia megastigma, Chorizema* species, *Anigosanthos* (Kangaroo Paw) species, and the annual *Helichrysum bracteatum.* This short list can only give a little idea of the beauty of this flora and consequently the western Victorian region is overshadowed as far as our gardens are concerned. However, we do have a number of myrtaceous and proteaceous plants from the latter, e.g. *Grevillea lavandulacea, Lhotzkya alpestris* and certain *Eucalyptus. Acacia* species and other legumes, *Prostanthera rotundifolia,* etc., are other examples. Many species from this part of Australia and the adjoining areas to the east were among the first introductions from that continent to New Zealand, arriving here in the middle decades of the last century.

A HORTICULTURAL JOURNEY TO WESTERN AUSTRALIA

Part V

W. R. STEVENS (Wanganui).

Our plans were for a climb up one of the steep peaks of the Stirling Ranges the next day, and as we knew this would prove to be strenuous, we decided on an early night. However, there was so much to talk over about the strange and brilliant plants we had already seen that it was quite late before we all went to bed.

Harry was first out in the morning and, as it was quite sharp and cold, we were glad of a hot cup of tea before we cooked breakfast. This meal over, and the chores done, we set out. As the track would be rough and hard on a car, Alf decided we should all pack into the Landrover. It was a nice clear morning and the weather forecast was for a fine warm day.

As we left the cottage I noticed a large number of *Acacia* trees, round topped and somewhat bushy, about 20 feet high, and enquired from Alf what was the species. He replied 'Jam,' and said 'This is real Jam country.' Noel and Harry looked enquiringly to see if this answer conveyed anything to me. As it happened it did, and I told them that this was *Acacia acuminata.* Naturally, the next question was 'why Jam?' I referred this to Alf, who explained that it has acquired this name owing to the fact that, when the tree was freshly cut, the wood smells just like raspberry jam. Weeks later we were able to verify this when we saw a heap of the wood of this species which had just been cut. Naturally we all had a sniff at it, and it certainly *did* smell amazingly like raspberry jam, so that we were all satisfied that the vernacular name was justified. Incidentally it is always confusing—and frustrating—to an overseas gardener when enquiring the name of any native plant, to be given the common or local name. Rarely are such names illuminative, and usually they are no answer at all. Instances of this are Eczema Bush (*Baeckea camphorosmae*), Bacon and Eggs (*Nemcia capitata*), Towart (*Eucalyptus gomphocephala*) and so on. Of course the same criticism applies to New Zealand, and we should not think of giving the botanical names of such plants as Rimu, Kauri, or Titoki, unless we were asked by an overseas visitor, who naturally would not know anything of the Maori names for those trees. But it does emphasise the real need for our local horticulturists to familiarise themselves with the Latin botanical names which have universal acceptance.

As we were rather cooped up in the Landrover with its covered sides and roof we could not see much of the flora on our return trip via another route. But Alf stopped several times to allow us to browse. One vivid patch of colour was supplied by a group of *Beaufortia cyrtodonta.* This was growing in broken rock and the massed flowers were a vivid red. The plants were not more than 3 feet high, and the foliage was grey and slightly sparse. In cultivation here, this plant runs to foliage and produces very few of its vivid flowers. Another stop Alf made was off the road into a depression under some tall eucalypts. Here we found a colony of *Conospermum amoenum* (syn. *dorreinii*), a delightful small growing species with strikingly vivid blue flowers. In another similar area was a large patch of *Eriostemon nodiflorus,* about 18 inches high, with masses of starry lavender-blue flowers. It was an entrancing sight and we determined that we must grow both these species in New Zealand. At this time of writing, I can report that we have introduced *E. nodiflorus* and flowered it. But its behaviour under our conditions is very far from satisfactory. Amongst others, the factors of physical conditions are very hard to reproduce in New Zealand, particularly that of providing high shade. Many plants in Australia demand such conditions. However, if we were to attempt planting under our tall eucalypts in our usual soils, all that

would happen would be to kill the plants with drought. Our soils rarely are so retentive of moisture as the soil compounded from broken quartzite or rotten rock.

About ten o'clock we stopped in a dry pass and here we left Freda to establish a base. We drove on, rising all the time, until the track became impassable even to the Landrover. Alf said 'All out here, we'll have to walk and climb from now on.' So off we started and very soon there was no visible track, as we were scrambling through rough scrub about 10 feet high. The scrub was composed mostly of *Hakea* and *Acacia* species, and it was quite hard going forcing our passage through the wiry, often rigid growth. One of our party asked about snakes, but Alf said we were making so much noise that no snake would stay in our way. The rough foliage had to be dodged as much as possible, but this was not easy, particularly as we were climbing all the time. It was getting hot and we wondered if we would ever get out of this beastly clothes-catching growth. About an hour later we suddenly emerged from it—to the great relief of everyone. Here we rested for awhile. We were now over 2,000ft. and the view as we looked back over the Kalgan Plains was superb. From then on it was tricky climbing, and we were sadly out of practice.

An unusual shrub on the upper slopes was *Hypocalymma myrtifolium* with cream flowers just opening. The only other species of *Hypocalymma* we were familiar with was *H. robustum*, the well-known 'Swan River Myrtle'. But this was quite different in growth habit though the actual flowers are similar in form but different in colour. In cultivation in New Zealand *H. myrtifolium* seems quite amenable to ordinary garden conditions, and forms a rather compact plant up to 3 feet. It is very free flowering but not particularly showy, as the flowers are packed closely to the stem amongst somewhat broad foliage. For all that, it has a certain charm.

On the lower side of a cliff we came across a fine specimen of *Banksia solandri*. At a distance it resembled a *Magnolia* with large sinuate leaves. This species has rather open growth, with upright flower spikes produced both terminally and from short lateral growths. It was not yet in flower, but the large brown woolly spikes were most striking and decorative. Now that I have grown and flowered in my Wanganui garden I can say that it is far more beautiful in bud than in flower. When the stamens emerge it makes the spike appear as though it had been attacked by flies, and is drab and untidy, being then anything but attractive. This is disappointing as when we saw it in bud there was an air of nobility about it.

Almost hidden amongst low scrub we found *Darwinia leostylis*, a lovely little shrub with inch-wide, bell shaped flowers, and small pointed leaves resembling an *Erica*. The colour of the oval shaped conspicuous bracts, which surround the deep set flower cluster within the bells is hard to describe. The best I can do is to call it a pale translucent crimson lake. In cultivation in New Zealand its flowers appear slightly smaller, though this may be due to our recent drought conditions, combined with the fact that we are growing it in full, unshaded sun. For this type of shrub, and for many others from Australia I should imagine that a bush house, with light overhead covering, would make for more congenial conditions.

The rock of the steep slopes in many places formed large jutting shelves, and most of the plants were growing in depressions where a certain amount of humus from decaying foliage had collected and was moisture conserving. A way around these shelves was not always easy to find, and by this time we were feeling rather tired. Eventually we agreed that we should not have time—or energy—to get to the summit, so we started down again, clutching the numerous specimens we had collected.

When we eventually arrived back at the Landrover all of us were feeling weak at the knees, and were thankful for even a hard seat on the ground. When we got back to where we had left Freda it was a cheering sight to see a billy boiling over the fire and a picnic lunch laid out. A short rest, and it was time to start back to our farm

cottage. One stop only was made to browse in low scrub near the road. A small shrub with purest white terminal flower heads was very common here. This was *Sphenotoma gracile,* a very showy epacrid with rather stiff stem-clasping foliage. It is worthy of mention here that the Western Australian flora does not contain a single member of the *Ericaceae,* this family being replaced throughout Australia by *Epacridaceae.*

That evening it rained heavily, so we decided to change our plans for the next day and, instead of doing any more climbing, we took a long drive around the base of the Stirlings. On this trip we took both the car and the Landrover. Alf was leading and he stopped a number of times when he thought there was something particularly interesting to see. Most of the plants were quite new to us and we made many notes of those we thought might succeed in New Zealand. Along the roadside were vivid patches of *Thomasia grandiflora* and a *Tetratheca* species. The *Thomasia* grew about 3 feet high and almost smothered itself with its rose pink flowers. The *Tetratheca* was a sprawling bush of a vivid lilac-rose, the flowers being open, four-petalled, and almost bell-shaped. At a guess we should have said that the thomasias belong to the potato family, but we should have been far out, as it belongs to the *Sterculiaceae!* One of the fascinating and intriguing differences in the Western Australian flora—and indeed of the flora of all parts of Australia—is the strange forms which some of the larger orders of plants assume in this geologically long isolated continent.

The next time we stopped we were provided with another thrill. A colony of *Actinodium cunninghamii* was in full flower. This is commonly called the Albany Daisy, and it does look for all the world like a many-petalled double daisy. The plants ranged from 1 to 3 feet, all carrying masses of terminal flowers on wiry stiff stems. There was considerable variation in colour, some being pale pink, almost white, other were a deep rose, intensifying in colour to the centre. We could hardly tear ourselves away from this lovely sight, and we vowed to grow this plant, whatever the difficulties. I will record now that we have grown and flowered it, though our plants are not bushy as in nature, nor are they so free with their lovely blossoms. It apparently requires a much lighter subsoil than I have, and more winter and spring moisture. I imagine it would do much better in sandy, swampy soils. Incidentally, *Actinodium* does not belong to the *Compositae,* but most surprisingly to the myrtle family, another instance of the strange forms to which some families have evolved in Australia.

Presently Alf led us into a narrow pass and, as we rounded a bend, a gasp escaped us all. Here was a sight to thrill the gods! We could not get out quickly enough for a closer inspection. Hundreds of specimens, growing amongst sparsely scattered eucalypts, of *Banksia*

coccinea were in full flower. This lovely, most distinctive *Banksia* is one of the most famed of Western Australian plants, and coloured pictures of it appear very often on Government brochures. We stood amongst the brilliant scarlet and silver flowers and marvelled—so much lovelier they were than any colour plate we had seen. The plants were of all heights, some only 3 feet, others over 10 feet. Individually, they were leggy plants with single or double leaders, but all bore the brilliant terminal flowers. The leaves are stiff, and cluster alternately around the stems, hiding nothing of the beauty of the flower heads. This plant has been the despair of a number of New Zealand gardeners who have tried it, as it has proved most difficult to establish successfully. My own plant is now seven years old, and flowers regularly every year. It may therefore be of interest to some readers to know how I have managed to succeed with it.

The first essential is deep drainage, and almost as important is that it must never be allowed to dry out. Combining these two conditions is a problem unless you are prepared to give it really sharp drainage and then water it as it requires it throughout the summer. With my heavy clay subsoil, it almost seemed ridiculous even to attempt to grow this plant, but I was prepared to go to any pains to succeed with it. I decided to try it over one of my tile drains which are about 2ft. 2in. below the soil surface. A large wide hole was excavated down to the tile depth and the top soil and clay removed. I then procured a load of pit metal, mixed in a small amount of peat and sand with it as well as a barrow load of old compost. When this had been thoroughly incorporated it was used to fill the wide deep hole. Finally a light dressing of coarse pumice was worked into the surface mix to the depth of about 1 foot. I was not really hopeful of growing it well, but thought that at least I might see it flower in my garden once. In two years the plant, then about 4 feet in height, produced its first flower. But I did not fancy allowing it to become leggy, and promptly cut the flower head to induce more leaders. This proved most successful, and I have continued to follow this practice for the last four years. My plant is now reasonably bushy and carries up to twenty flowers a year. One other important point—the plant must be staked firmly and well from the start as its root system is not sufficiently deep nor extensive enough to support the somewhat heavy top growth.

Harry took many photographs of that wonderful colony so that we now and again could refresh our memory of that excitingly beautiful vista. One further remark on the seed follicles. These are small and deep set, only about an inch in length and a quarter of an inch wide. It requires a special technique to extract the seed.

Truly it had been a day of thrills and as we drove on we felt we had almost reached saturation point having seen so much beauty. But a few miles further on we ran into very sandy country, and here were great colonies of thousands of *Anigosanthos humilis* in flower. Most of them were orange yellow, but occasionally we saw patches of them with deeper orange red flowers. This species, commonly known as Cat's Paws, flowers quite well in New Zealand, but it must be remembered that it is its habit to die down during the dry summer months. So completely does it disappear below the soil surface that it is easy to imagine that you have lost it entirely. But with the first autumn rains new leaves appear from below ground level, and the buds begin to form towards the end of winter. It is a lowly species growing not more than a foot and often nearer to 6 inches.

Further on, in patches of dry hungry soil, we found a number of *Banksia* species, though had not Alf told us we would never have known what they were. For they were not shrubs at all but produced sprawling low growths not more than a foot in height. There proved to be two species present, *Banksia goodii* and *Banksia repens.* The former had 5 inch, light brown velvety flower heads, produced perfectly upright amongst the scrambling growths and elongated leaves pinnate, and upright and spirally produced. *Banksia repens* showed upright leaves from ground hugging growths, these leaves being quite decorative, somewhat twisted and glaucous in maturity but brown velvet and soft on the new growth. The flower is about 8 inches in height, with a rather spotty effect of crimson and brown. Like *B. goodii,* the spikes are borne upright from trailing growths at ground level. But in *B. repens* there is an almost fantastic beauty in the velvet brown young leaves or pseudo-bracts which precede the actual formation of flower buds. Both species can travel horizontally for many yards and both have settled down well in New Zealand and never fail to cause surprise and admiration. In planting these species it is well to remember they require space around them to allow them to wander.

Another *Banksia* species that was not uncommon in this area was *Banksia speciosa,* a small tree not uncommon in New Zealand. In the hungry soil in which they are native they do not, however, often reach the height we get in our better class soils. Here it is common to see specimens of 15 or even 20 feet, but in nature they rarely attain more than 5 or 6 feet. This species does best in light soils, deep and well drained. The bud cones are pure soft silver, but when the flowers develop the cone changes in colour effect to a pale yellow. I can say quite truthfully that this is a species that grows much better in New Zealand than in its native habitat.

CHARM OF DAISIES

A Survey of the Seasons

A. W. ANDERSON (Timaru).

From the ends of all the earth they come, daisies of every hue and shape, asters from China, gerberas from South Africa, dahlias from Mexico and chrysanthemums from Japan. They are the largest family of flowering plants and embrace about 1,000 genera and well over 14,000 species, which means that one out of every ten species of wild plants, the world over, belongs to the *Compositae*. Although we have several trees, one climber and many shrubs in our native flora this is very unusual, because about 98 per cent. of the family are herbs, and it must be confessed that most of them are worthless weeds. Nevertheless, the daisies contribute more to the beauty of our gardens than any other family.

The *Compositae* have been so successful in colonising every conceivable situation the world over, cliffs and mud-flats by the sea, rocks, riverbanks and lakesides, through forest and scrub to the highest altitudes at which plants are found, because they have managed to overcome two of the fundamental problems of plant life. They have developed a highly successful method of mass-producing their seeds and have combined it with a very efficient way of distributing them.

The Complex Daisy

For all its apparent simiplicity, a 'single' daisy is a very complex structure, a highly organised collection of small florets acting, to all intents and purposes, as an individual flower. The flower-head is, in fact, a compressed spike, compounded as it were of many individual flowers—and highly developed ones at that, as may be seen in the inferior ovary and the fusing of the five petals into a tubular corolla. In some, such as the *Gaillardia,* each floret is almost star-like and the five petals can be recognised for what they are, but in most cases they form a bell-like tube whose origin may be traced by the five small teeth set along the rim. The sepals may be modified, reduced or absent. They are well developed in *Arctotis* and Linnaeus gave the genus its name because he thought they looked like bears' ears (from *Arcto,* a bear, and *otis,* an ear), as anyone can see with the help of a pocket lens. But in most cases they are reduced to hair-like structures which are capable of developing into parachutes as the fruits ripen, and can carry them far and wide. The flower-heads have the appearance of being single flowers because the tightly packed florets are surrounded by one or more rows of petal-like rays. These are specially developed florets, complete with style and ovary at the base, advertising agents whose task it is to arrest the attention of passers-by with the prospect of a feast within.

This brings us to the realisation that the family has two distinct kinds of flower-heads: those composed of tubular florets like the conventional daisy, and others in which the florets are all strap-shaped like those of the dandelion. Thus we get two very distinct forms of 'double' daisies, viz. the so-called anemone-centred chrysanthemums, marguerites and dahlias in which the florets retain their tubular structure although often considerably enlarged, and the double asters, marigolds, chrysanthemums and dahlias in which all the central florets have become strap-shaped. In some cases these 'double' flowers seem to be incapable of setting seed and might be cited as examples of advertising gone mad.

In the Garden

Daisies are the backbone of the flower border and with a little planning we can have some of them in flower from the time the garden wakes up in early spring until the frosts come to let us know that winter is not far off. Even in winter there are some, including the lovely blue *Felicia amelloides,* the variously coloured marguerites, such as the pure white 'Mrs. Sanders' and the pale lemon 'Etoile d'Or' as well as some fine pinks, of which the best is 'Mary Wootton', which, if cut over and watered in late summer, will flower in a warm place all through the cold weather.

Spring brings us the first of the golden daisies, the doronicums rising on leafless stems from their fresh young foliage, the best being *D. plantagineum* var. *excelsum.* They like semi-shade and at the end of their short season may be lifted from their prominent position and transferred to some cool patch of the vegetable garden in preparation for a summer of retirement before facing the limelight next spring. The old-fashioned Blue Bottle, *Centaurea montana,* is the first of a useful race that will keep up a supply of colour and interest from October to March. There are blue, rose and white forms and all are very hardy. Its close relative *C. macrocephala* is a special favourite of mine because the plump buds, clothed with their chestnut-brown scales are every bit as attractive as the handsome yellow flower-heads. Another fine plant is *C. dealbata* var. *steenbergii* which has rosy-purple flowers with prominent white centres rising above its clumps of grey-green foliage. But most striking of all is *C. babylonica* with its silvery, dock-like leaves and silvery spires set all up the side with lemon-yellow flower-heads, to a height of 8 feet or more.

South Africa has given us many beautiful daisies and most of them, like other members of the family can be induced to flower over long periods if they are kept from setting seeds. First of them to open is *Arctotis revolutus,* worth growing for its mounds of grey alone and doubly desirable when seen in all the glory of its cadmium-orange flowers. These are the colourful fore-runners of the gay *A. scapigera*

hybrids which run through all the colours from glowing bronze-red through various shades of pink and rose to violet and lavender back to lemon and brilliant orange through the greater part of the year.

Then there are the dimorphothecas, lovers of a hot sunny corner, beginning with the pink *D. barberiae* and soon to be followed by the golden *D. chrysanthemifolia,* and the glistening white *D. ecklonis,* whose purity of colour is enhanced by the disc and reverse being decked in shades of violet-blue.

Erigeron 'Quakeress'

(see page 24)

The Yellow Tones

Tones of yellow, lemon, gold and orange are probably most common but no border worthy of the name can afford to be without such charmers as *Anthemis tinctoria* 'Perry's Variety', whose finely cut, grey leaves are the perfect setting for its lemon daisies; *Coreopsis* 'Baden-gold' that is rich and profuse all through the summer and so useful for cutting; *Bupthalmum salicifolium,* one of the best golden daisies and *Inula royleana* from the Himalayan wilds, one of the largest of them all, its compact velvety disc fringed by slender rays like golden cushions surrounded by finely wrought threads. It is not an easy plant to grow well, demanding partial shade and plenty of moisture. Among the best for the front row is *Erigeron aurantiacus* whose burnt orange colour is unusual in a genus whose best known members dress in lavender or blue. Most fetching of them all is 'Quakeress', so neat and trim in her habit of amethyst-violet.

There are many to supply an excellent range of blue tones and they nestle down very comfortably among the yellows. *Catananche caerulea* is not unlike the common cornflower at a distance, but is easily identified by its crisp, chaffy buds which resemble everlastings. They open to reveal flowers that may be lavender, white or a combination of both and like a warm sunny spot, very different from the cool semi-shade beloved of *Stokesia laevis* which is not unlike a semi-double China Aster. A late flower that isn't at its best until February, the *Stokesia* is somewhat variable from seed, but these seedlings are well worth growing because they form such a contrast to the size and colour of 'Blue Moon', a gorgeous thing whose 6-inch-wide flowers are always admired. You rarely see Chicory, *Cichorium intybus,* in the flower border and this is a pity because there is nothing quite like it with its stiff angularly branched stems and the loveliest of all blue flowers. They are like little dandelions pressed close to the stalk and may reach 6 feet in a soil that is fairly moist but not too rich.

Reds and Pinks

Red and pink tones are harder to find outside the gerberas, dahlias, chrysanthemums and perennial asters whose hosts are such that we can give them no more than a salute in the passing. Of course there are the pyrethrums, whose elegant daisies on their long stems are in evidence all through spring and early summer. Botanically they are now merged in chrysanthemums, but they are so indespensible and the name *Pyrethrum* so convenient that the gardener may be excused his conservatism. The somewhat coarse *Achillea millefolium* 'Cerise Queen' might be passed over were reds more plentiful, but it is very useful for filling up early in the season, and may easily be eclipsed by a well placed *Helenium* before it becomes too tatty.

Echinacea purpurea 'The King', on the other hand, should be planted generously, and near the front, because its unusual flowers of purplish-rose with their prominent cones are something quite out of the ordinary. The same sort of place should be found for plenty of the Kansas Gayfeather, *Liatris spicata,* whose blazing torches of rich mauve are always effective. Coming late enough in the season to mask many a gap is the Joe-Pye Weed, *Eupatorium purpureum,* 5 feet high with flat, somewhat fluffy heads that are not very showy from a distance but help to give variety.

Striking and Unusual Plants

When planning a hardy flower border one has to give considerable thought to the provision of plants of striking or unusual habits of growth, that can be used as focal points to distract attention from the uniformity of the rounded bush, the most common growth form

(*Continued on page 28*)

A SURVEY OF THE SEASONS

Name	Flowering in weeks	Height	Colour
Doronicum plantagineum var. *excelsum*	Sept. 2 — Nov. 4	2½ft.	Golden yellow.
Arctotis revolutus	Oct. 2 — May 2	1ft.	Bright cadium orange.
Centaurea montana	Oct. 2 — Jan. 3	15ins.	Violet-blue, pink and white.
Pyrethrum 'Scarlet Glow'	Oct. 3 — Dec. 2	2ft.	Chrysanthemum crimson.
Dimorphotheca barberiae	Oct. 3 — Jan. 4	2ft.	Soft pink.
Gaillardia aristata vars.	Nov. 1 — May 1	2ft.	Glowing red and soft yellow.
Erigeron aurantiacus	Nov. 2 — Jan. 3	1ft.	Rich burnt orange.
E. speciosus 'Quakeress'	Nov. 2 — Jan. 3	18ins.	Soft amethyst-violet.
Bupthalmum salicifolium	Nov. 3 — Mar. 3	2ft.	Buttercup yellow.
Centaurea macrocephala	Nov. 4 — Jan. 2	4ft.	Aureolin yellow.
Achillea 'Cerise Queen'	Nov. 4 — Mar. 2	3ft.	Rather hard serise.
Chrysanthemum maximum	Nov. 4 — Mar. 4	3ft.	White Shasta Daisies.
Centaurea dealbata var. *steenbergii*	Dec. 1 — Feb. 3	2½ft.	Soft mauve-pink.
Helenium 'Mdme. Cannivet'	Dec. 1 — Feb. 4	2ft.	Rich golden yellow
Anthemis tinctoria 'Perry's Variety'	Dec. 1 — Mar. 4	2½ft.	Clear lemon yellow
Dimorphotheca chrysanthemifolia	Dec. 3 — Mar. 3	18ins.	Bright golden yellow
D. ecklonis	Dec. 2 — Mar. 3	18ins.	Glistening white and violet.
Catananche caerulea	Dec. 2 — Feb. 4	2ft.	Lavender, white.
Coreopsis 'Badengold'	Dec. 2 — Feb. 4	2ft.	Rich golden yellow.
Cichorium intybus	Dec. 2 — Mar. 4	6ft.	Purest flax blue.

Names	Flowering in Weeks	Height	Colour
Achillea eupatorium	Dec. 3 — Mar. 4	6ft.	Lemon yellow.
Helianthus 'Daniel Dewar'	Jan. 1 — Mar. 2	6ft.	Bright orange.
H. 'Soliel d'Or'	Jan. 1 — Apr. 2	6ft.	Golden yellow, quilled florets.
Inula glandulosa	Jan. 1 — Feb. 4	2ft.	Pure saffron yellow.
Inula royleana	Jan. 3 — Feb. 3	18ins.	Soft cadium orange.
Centaurea babylonica	Jan. 1 — Mar. 2	8ft.	Yellow: silvery stems, foliage.
Achillea 'Boule de Neige'	Jan. 1 — Mar. 1	18ins.	Dainty balls of white.
Artemisia lactiflora	Jan. 2 — Mar. 4	6ft.	Pale yellow plumes.
Echinacea purpurea 'The King'	Jan. 2 — Mar. 4	3ft.	Pleasing shade of purplish-rose.
Echinops ritro	Jan. 3 — Apr. 2	4ft.	Globular heads, pale blue.
Liatris spicata	Jan. 3 — Feb. 4	30ins.	Bright mauve.
Stokesia laevis 'Blue Moon'	Jan. 3 — Mar. 3	18ins.	Soft heliotrope.
Rudbeckia 'Herbstsonne'	Jan. 3 — Apr. 1	7ft.	Lemon yellow
R. speciosa	Jan. 4 — Apr. 1	18ins.	Lemon yellow with black centre.
Solidago 'Gold Elf'	Jan. 4 — Mar. 1	2½ft.	Buttercup yellow.
Eupatorium purpureum	Feb. 2 — Mar. 4	5ft.	Rosy purple.
Solidago missouriensis	Feb. 3 — Apr. 2	5ft.	Rich golden yellow.
Helenium autumnale var. *superba*	Mar. 1 — Apr. 3	6ft.	Pale orange.
Helianthus salicifolius	Apr. 2 — May 3	7ft.	Buttercup yellow.

(*Continued from page 25*)

among herbaceous plants. It is equally important to arrange some tall-growing late-season kinds so that they mask the gaps caused by the passing of those which were the glory of the border earlier in the season. The daisy family has an answer to both those problems. By the beginning of December the earliest kinds are already over and gone, but the tall chicory and the first of the *Heliopsis* and *Helianthus* have come out into the open and, revealing their potential height, show that they can take up all the space available. Soon afterwards they are reinforced by the tall heleniums, *Artemisia lactiflora* so decora- with its pale moonlight-yellow plumes, and the first of the golden rods. Earlier in the season we have had the 8 feet slender spires of *Centaurea babylonica* a perfect foil for the broad flat heads of *Achillea eupatorium* so outstanding among its conventional neighbours. Another individualist is *Echinops ritro* whose close relatives follow the same habit of growth, tall plants whose foliage is almost as decorative as the metallic blue flowers which are clustered in balls that are quite unlike anything else.

So it is no mean boast that the daisy family is the backbone of the flower border. With all the diversity of its 14,000 species from all over the world, it can provide plants for every kind of site from the small achilleas, *Arctotis* and erigerons that make up the front row, through the crowds of medium-sized kinds to the giants of the back which can be relied on to give height and proportion to the whole. Among them are the taller of the *Helianthus, Helenium* and *Solidago* genera going up to 6 feet or so, to the towering *Centaurea babylonica,* the silvery skeleton of the Holyrood Thistle, *Onopordum acanthium,* and the somewhat ragged *Rudbeckia* 'Herbstsonne' which may all go up to nearly half as much again. The daisies are an easy-going crowd and most would be perfectly happy in the ground that could produce a good cabbage, disdaining food fads, and providing colour and interest for the greater part of the year.

SHADE IN YOUR GARDEN

DOUGLAS ELLIOTT (New Plymouth)

When you read your nurseryman's catalogue and see how many plants need 'an open sunny position' you might begin to think the ideal garden is one where the sun blazes down into every corner. But how wrong you'd be! Your garden needs shade as well as sun.

There are several reasons why shade is an important part of the good garden. Take the plants. Although most of them like—and need—a lot of light, some prefer shade, and a great number thrive

Dappled shade cast by tall silver birches
(photograph Douglas Elliott)

in dappled shade, or in places where they are shaded through the middle of the day but where the sun floods them with light in the morning or late afternoon.

Then there are the human inhabitants of the garden. If you really use your garden as a living area you'll welcome the shade of overhanging branches when you sit outdoors in the summer.

But I think one of the most important reasons for having shade in your garden is that it adds greatly to the beauty of your garden picture. The pools of darker tone make the colours of flowers and foliage brighter by contrast. They also give a feeling of solidity. Leaves of trees and climbers make beautiful shade patterns on paving and paths that might otherwise be stark and glaring.

A picture illustrating this comes to mind as I write. It is in an Auckland garden I often visit. A doorway in a wall leads into a small paved yard. At the farther end the sunlight reflects harshly from the greyish-white paving; but just through the door there's a cool pattern of shadows made by a grape vine trained over a pergola. Every now and then the pattern comes to life as breezes stir the leaves. I find this just as satisfying as a beautiful plant in flower.

The obvious way to make shade is to plant trees. In the town garden they should be mostly deciduous. For this reason: when they are bare in the winter they let light through to the soil, plants, and grass beneath them—to the benefit of all. And if they are near the house they keep very little light from the windows. In the summer their leaves are usually lighter than those of evergreens and that is good for the plants.

At the bottom of our garden we have a big silver birch (*Betula pendula*), a double red flowering peach (*Prunus persica* 'Sanguinea Plena'), three *Laburnum alpinum* 'Vossii', a couple of Lawson's Cypress (*Chamaecyparis lawsoniana*) with a particularly attractive drooping habit, one *Magnolia campbellii,* and four *Prunus campanulata.* The two cypress are the only evergreens. In the summer nearly every visitor says: 'What a lovely shady walk.' And of course the trees give us privacy.

Another pleasant shade picture is made by a weeping golden willow (*Salix vitellina* 'Pendula'), that grows over some crazy-paved steps. When the shadows move swiftly as the wind tosses the willow branches, the effect is very attractive.

'What plants do you use under your trees?' you may ask.

Well, come and see for yourself. I'm writing this near the end of September and the main display at the moment is from polyanthus —bought as 'Pacific Giants' but actually 'Tasman Trash', but pretty

for all that. Cinerarias back of the polyanthus are deep blue and purple; they love the shade and are not really happy in the open. Two groups of *Clivia miniata* have big flower-heads of rich apricot flowers, not the best colour to mix with the cinerarias. Clivias thrive in shade but will survive morning or afternoon sun. Drifts of volunteer forget-me-nots fill in the gaps and make the other plants look comfortable. A few Kurume azaleas are doing quite well now, although they started badly because of woodash in the soil. They like some sun.

Delicate tracery of leaf shadows on wall and terrace
(photograph Douglas Elliott)

A patch of *Ajuga reptans* gives good all-the-year-round ground cover. It has rosettes of copper-coloured leaves; in late October and November the deep blue flowers will come in perky little spikes.

A clump of *Lilium* 'Jillian Wallace' is sending up huge thick shoots that look like a good substitute for asparagus or bamboo shoots. Some of our favourite shade plants are also shooting—the plantain lilies (*Hosta*). We are collecting these attractive plants and now have seven different kinds. They all have handsome leaves, some variegated, many very large, and all ideal for floral arrangements. The mauve, bell-shaped flowers on tall willowy stems are charming, if not showy. One species, *H. plantaginea,* has fragrant white trumpets that come only just above the large pale green leaves.

Of course there are many other plants that do well in shade. If you like something a bit exotic you can grow tuberous begonias. Treat them with care—store them indoors in the winter—and you'll have them for years. Other primulas besides polyanthus like shade. You can get the seed of several very good kinds from England. *Salvia* 'Bonfire' does well in partial shade and that's just where its fiery scarlet flowers look wonderful. Lily-of-the-valley (*Convallaria majalis*) and bluebells (*Scilla*) like shade and create an old-world atmosphere. And of course ferns of all kinds revel in the shade cast by trees and tall shrubs.

As to the shrubs that like shade, there are many to choose from. Most rhododendrons and camellias like broken sunlight; a few rhododendrons like real shade. For instance, *R. grande,* worth growing for its magnificent leaves alone, is thriving in deep shade at Pukeiti. Hydrangeas keep their colour much better and the flowers last very much longer in light shade.

Here are some of the many other shrubs that like these conditions: *Aucuba japonica* (handsome leaves, brilliant red berries in July and August), *Bauera sessiliflora* (small Australian shrub with stiff stems studded with magenta flowers); *Ceratostigma willmottianum* (deep blue flowers in clusters at tips of slender branches); *Cotoneaster* in variety; *Coprosma williamsii* 'Variegata' (very pretty native shrub, but frost tender); *Daphne odora* and varieties (these plants are very adaptable, thriving in full sun as well as shade); *Desfontainea spinosa* (holly-like leaves and scarlet and yellow tubular flowers, likes cold winters); *Euphorbia wulfenii* (hydrangea-like heads of lime-green flowers in winter); *Fatsia japonica* (old-fashioned plant with palm-like leaves); *Fatshedera lizei* (similar to *Fatsia* but leaves smaller and more like ivy); fuchsias; *Hypericum* varieties (golden flowers); *Kalmia angustifolia* 'Rubra' (2 feet high, rosy red flowers); *Kalmia latifolia* (Calico Bush or Mountain Laurel, acid soil, also thrives in full sun);

Loropetalum chinense (flowers like big white Witch-hazel, 4 to 5 feet rounded evergreen); *Macropiper excelsum* (native Pepper Tree or Kawa Kawa, fine for giving shelter in shade); *Mahonia* varieties (barberry-like shrubs with yellow flowers); *Monstera deliciosa* (handsome foliage plant, usually a house-plant but grows well—and fruits—outdoors in mild climates), *Nandina domestica* (attractive foliage plant, berries in cold districts); *Pieris forrestii* (brilliant red new shoots, white flowers); *Pieris japonica* (common *Andromeda* or Lily-of-the-valley shrub); *Pentapterygium serpens* (low grower with waxy red bells); *Ruscus aculeatus* (Butcher's Broom, related to *Asparagus,* has brilliant red berries; 2 feet high); *Sarcococca ruscifolia* (waxy leaves, translucent dark red berries); *Skimmia fortunei* (red berries); *Viburnum japonicum* (the good old evergreen *Viburnum* with big clusters of brilliant red berries—if you can get it to fruit).

Desfontainea spinosa
(see page 32)

(photograph Douglas Elliott)

These plants like not only the shade but also the damp soil and leafmould that usually go with it. If the shade gets too dense, you can always lighten it by cutting away some of the branches or even, if necessary, by removing some of the trees. After all, that's something most of us find we have to do to prevent the garden becoming a jungle as the years pass.

So, you see, shade is something that adds to the beauty of your garden both by itself and also by letting you grow plants that don't like too much sunlight.

HIGHLIGHTS OF NATIVE FLORA AT PUKEITI

A. D. JELLYMAN, N.D.H. (N.Z.)

People who visit Pukeiti are endowed with a unique opportunity to review the native flora of this rainfall forest area from easily accessible, and well kept paths. Even from the Pukeiti Lodge, across the sweeping lawn, you feast your eyes upon the landscape backdrops of native bush, and the slopes of the Pouakai Ranges to the south. There are many intensely interesting native plants to be seen in this area, where the flora is dominated by the Kamahi, *Weinmannia racemosa.*

Most readers will have, at some time, come into contact with supplejack, *Rhipogonum scandens.* It is a vine whose long, twisting stems bind from one tree to another impeding progress if you are trying to get through them. Well, this grows as well at Pukeiti, as it does anywhere in New Zealand. Dr. Solander, the botanist on Captain Cook's first journey to New Zealand in 1769, collected it at Tologa Bay, Mercury Bay, the Thames River and Queen Charlotte Sound, and gave the first botanical description of it. The Maoris knew it as 'Kareao' and made many uses of it as lashings for various purposes, while even in the Chatham Islands it was used to lash together toe toe huts. Botanically speaking, the supplejack is a monocotyledon, belonging to the plant family *Liliaceae.* The root stock consists of a creeping rhizome which sends up young shoots that grow rapidly to a height of about 6 feet. These stems are black, knotted at the joints or nodes, which have small wedge shaped leaves which adhere to the joints and drop as soon as their function is completed. Having reached this stage the apex of the new shoot grows in a revolving motion until it catches on to a branch or twig of a nearby shrub and then rapidly twines around it until fully secured, then ventures upwards to sturdier support of the forest canopy. By this time the original host shrub is supressed, dies and rots away leaving the tall vines to hang free. As light intensifies, the leaves appear on the vine mostly on the tops of the forest canopy. The leaves are simple in form with netted veins, not parallel as in most of the lily tribe, which includes our flaxes and cabbage trees. From the axils of these leaves appear the flower stalks with their sprays of small greenish flowers, each with six petals, six longer stamens and one short style. The fruit ripens to a $\frac{1}{2}$ inch long red berry which ripens during the season following October and November. The red berry fruits of the supplejack are most attractive and a feature of the bush at Pukeiti, and can be seen readily among many of the established walks there.

When the *Rhododendron* season is at its peak, there is a delicious scent as you go along the bush tracks, and if you looked for the source you would find in the shady undergrowth the Karapara, *Alseuosmia macrophylla,* in flower. Karapapa was discovered in October, 1826,

by Alan Cunningham at Hokianga when it was in full flower. The scent of it made such an impression upon him that he named it *Alseuosmia.* The derivation of the name is 'alsos' a grove and 'euosmia' a grateful odour; an allusion to the fragrance of the flowers in the native bush. Karapapa grows in the shade of the forest canopy as a hairless, branched shrub ranging from 4 to 8 feet in height. It grows in association with *Coprosma lucida* and *Senecio kirkii.* The leaves are leathery, from 2 to 7 inches long, egg shaped, with margins toothed to varying degrees. The flowers are produced singly or in bunches of four or five and consist of a tube 1 inch long opening out to a trumpet-like bell. Each flower hangs from a drooping stalk and emits a delicious fragrance. The colours of the flowers vary a good deal from full crimson to a pinkish cream. Usually the throat colourings are paler than the lobes and often the paler forms show darker lines in them. To round off this performance the Karapapa has an oblong crimson berry which persists for some time. At Pukeiti the predominant colour form is the crimson one. *Alseuosmia pusilla,* with its $\frac{1}{2}$ inch long yellowish to reddish flowers is also found growing here.

The coprosmas on the bush margins are well worthwhile mentioning as a highlight of Pukeiti because they are seen, not long and lanky as inside the forest, but as sturdy, attractive, densely foliaged plants that provide an excellent foil for others that grow along the borders in front of them.

The pale barked Karamu, *Coprosma lucida,* with its long leathery, egg-shaped leaves, offsetting the $\frac{1}{2}$ inch long bright orange drupe, is quite common, as is the similar *Coprosma robusta* which has dark brown bark, leathery, narrow, pointed leaves, which are paler beneath and has smaller fruits in clusters. The Kanono, *Coprosma australis,* is also common but easily distinguished from the former ones. Distinctive from these three is the thin leaved *Coprosma tenuifolia*; a glabrous, pale barked shrub, which grows up to 15 feet high. The leaves are ovate and pointed of a dull brownish-green colour with pale undersides and a conspicuous veining on both sides. The sexual parts of coprosmas are borne on different plants and only rarely is it found that both male and female are on the same plant. The male flowers consist of four anthers fastened at one point along the back to give it freedom of movement. This is one of nature's devices that assists in the dispersal of the copious quantities of pollen each male flower produces. On the female flower there is a minute corolla and a divided stigma, that resembles a minute wish-bone, which rises well above the corolla to catch any pollen grains shed by the male plants. Now if the pollen grains of *Coprosma lucida* were to alight on the stigma of *C. tenuifolia* and fertilization took place the resultant seedling could be an intermediate form of the two parents. This is exactly what has and is happening freely at Pukeiti, and forms with *C. tenuifolia* blood in them can be easily recognised. The crops of fruit carried by these

plants often form a brilliant display which is most arresting to the eye and generally makes you swallow any misgivings you have held previously against them. Truly the bright red and orange berries when seen in profusion put many of our prized cultivated berrying exotic plants to shame for brilliance.

As an attempt this season is being made to establish some of the naturally epiphytic rhododendrons on cleared stumps in an area which is being developed for bog garden, I will mention two outstanding native plants of this nature. In spring time when *Clematis paniculata* is flowering you may also be struck by a mass of shining white flowers so dense and prolific that most leaves of the plant are hidden. This plant is *Senecio kirkii,* a member of the great daisy family, *Compositae,* and was discovered in 1834 by R. Cunningham. At Pukeiti it is usually epiphytic, although occasional young plants are found growing on the forest floors, whilst in the Kauri forests it is always terrestial. The most prominent plant at Pukeiti is growing on a tree stump above the road leading to the lodge basement, at the entrances to Brewster Walk that leads down to the water wheel. It is an erect branching shrub with stout, brittle branches. The leaves are variable, ranging from 2 to 5 inches in length and up to 2 inches wide; they are fleshy, in the manner that a Livingstone daisy is, dark green above and paler below. The bell shaped flowers appear as flat sprays on the tops of branches, each flower head consisting of numerous disc plants (those in the pincushion centre) and the few ray florets whose spreading white ligules form the conspicuous part of the flower. These straplike outer petals are often over an inch in length and their snow whiteness renders them visible from a considerable distance. *Senecio kirkii* flowers so profusely in the spring that you could not fail to see it if you passed one. In January and February the seeds ripen and float away in their thousands upon the flight hairs nature has provided them with until they alight by chance on a suitable medium of decaying vegetation for the seed to germinate. In many cases the seeds get carried high up in the air hence the larger specimens recorded growing up in the forks of giant ratas forming bushes that spread over 20 feet. Personally, I have not yet seen this at Pukeiti, the plants I know always seem to be perched on an old tree stump and so may be only 10 feet or so above the forest floor. One recent young plant I discovered on a rata stump was growing in dense shade and had germinated in a mould of fallen leaves and rotted wood.

The main area of Pukeiti has been the victim of the bushman's axe so the presence of giants of the forest is lacking except for the giant skeletons of the ratas whose silhouette gives a character to the otherwise flattish canopy of the present vegetation. These ratas (*Metrosideros robusta*) have apparently come to the end of a life cycle which may have been hastened by storm damage, opossum foraging or scale attack.

Besides these statues of the past, there are others in healthy growth, the best known plant being the giant rata at the foot of the *Maddenii* series Border. *Metrosideros robusta* or the Northern Rata, is one of our most intriguing epiphytic trees, whose habits are well worth mentioning. To begin life the seed of the rata alights high in the forks of a rimu or some such host tree where there is a clump of decaying vegetation. The seed germinates and grows rapidly until the food supply of the clump is almost exhausted. At this stage aerial roots are sent down the trunk, clinging to it by small sucker roots, until the roots reach the ground below. As increased nourishment is drawn from the soil the roots assume stem-like appearance and the vines eventually grow so large that they meet and coalesce to form a more or less continuous trunk. However, should the young root become detached from its host plant, horizontal roots will emerge and encircle the trunk until it meets another root or has made secure the aerial root. When a root like this meets another they often fuse by their cambium cells to form a natural graft which undoubtedly gives added strength to their purpose. As the aerial roots develop into trunks, their reddish brown bark begins to flake off in small pieces. There is a common belief that the northern rata strangles its host, which dies and rots, leaving a giant tree with a hollow centre. This belief may be true to a certain extent but it is certainly not as simple as that. Firstly the host is almost certain to be a mature tree when the rata begins to establish itself and so could well die of its own accord before the rata is of sufficient dimensions to strangle it. Secondly, the death of the past host may be and probably is expedited by two actions of the rata. The most important is by the umbrageous head it forms, that supresses the amount of light and freedom previously enjoyed by the host tree. The other factor is the increased competition for soil nutrients between an old matured plant and a young, vigorous and rapidly growing one. So really strangulation is the wrong expression. I prefer to refer to it as supression, or subjugation, if you like. Nature does seem to enjoy getting her own back on the rata for this domineering habit, because the living ratas are wreathed in a livery of many other epiphytic plants. Great colonies of kie kie, *Freycenetia banksii,* can be seen scrambling up the trunks at Pukeiti while the spreading boughs are homes of clumps of orchids and ferns in great profusion. The weight of these plants upon their epiphytic host is so enormous that great branches sometimes collapse beneath their ponderous load. Nonetheless this accompanying vegetation gives the rata a character all of its own, not mentioning its summer display of crimson blossom.

Generally the northern rata is considered epiphytic and although odd ground forms are sometimes found they never seem to come to much as far as ratas are concerned. However, along the Stoney River terrestial ratas, known locally as the Blue Rata, are quite common. It has a clean, yet smaller trunk than the true epiphytic type, and a

small head. In the latest *Egmont National Park Handbook,* A. P. Druce records this situation on the Pouakai Ranges where, as the result of the 'Newall' eruption some three hundred years ago, forest fires were started. The resulting forest was Kamahi and a semi-terrestial rata which began its life on burnt stumps and logs, that now give no indication of any host plant having been present at all. This same explanation could account for the Blue Rata.

Ancient, as most of our ratas are, they were put to many uses by the settlers of New Zealand. The Maori proverb 'Kei-whati-whati noa mei te rau o te rata' ('don't pluck or fling about to no purpose the blossoms of the rata') according to Colenso, means, 'Don't be ashamed when your lying is detected.' The wood of rata, being heavy and durable, was used for ships, tramways, carriage frames, wharves, bridges and firewood. When the Manawatu Gorge Bridge was constructed in 1873-74 ratas growing in the gorge were used in its erection.

Pseudopanax edgerleyi is an interesting plant that grows freely at Pukeiti and is often found growing on some other tree, hence another epiphyte. In 1849 Colenso and Mr. Edgerley discovered this plant which was known to the Maoris as Koareare in juvenile form and Raukawa in its adult form, while it is known commonly to others as orangewood because of the aroma of the squashed leaves. *P. edgerleyi* is a distinctive plant at all stages of growth and begins its life in the dense shade of the forest but often on a tree fern or stump of other trees. When young, the Koareare has thin glossy leaves that are three or five fingered, with cut lobes often extending to the mid rib. Yet when mature the Raukawa has leaves 6 to 8 inches long with wavy edges, carried on a jointed leaf stalk and reduced to one leaflet. The leaf reminds me of a wavy leaf form of *Pittosporum umbellatum* or the Australian *Pittosporum undulatum.* The dark shining leaves in both stages are very handsome and until a short while ago a nice young plant was growing on a ponga wall just outside the members' room of the Pukeiti Lodge. The flowers of Raukawa are dull green and produced in sprays, males on one plant and females on another. The fruits are round, fleshy and mottled, containing three to four seeds. They are rarely seen probably because they make good food for the native birds. The wood is white with a compact small silver grain but of little value, although some settlers used it for fence rails. To the Maori the Raukawa was a much sought after plant because of its scented leaves. They used to rub fresh leaves into their bodies or else mix the leaves with fat or oil and use the scented mixture for annointing purposes.

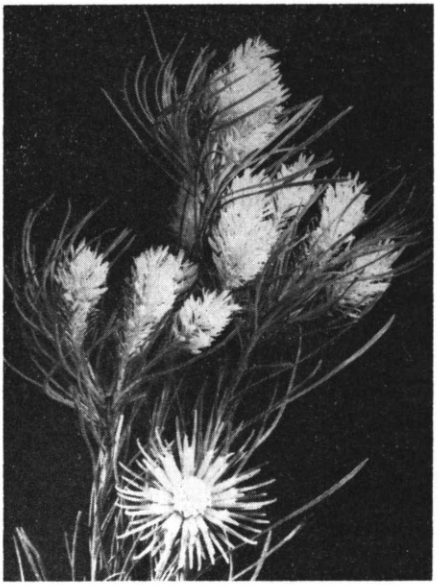
These plants I have mentioned are only a few of the many intriguing natives that grow here. Much more time and space would be necessary to discuss others fully. Nevertheless, this article will, I hope, enable visitors to Pukeiti to enjoy and appreciate the unique, serene beauty that the native plant community there has to offer.

AULAX PINIFOLIA

DOUGLAS ELLIOTT (New Plymouth).

The first time I saw *Aulax pinifolia* I thought it was a conifer. This was not only because of the pine-needle-like leaves; nestling amongst the branches was a cluster of what looked like small pine cones. They were green and deep red.

That was in September; it was not until the following February that I saw the flowers. The females—round, spiky looking, and about 2in. across—were on one plant; the males—in feathery racemes about 2in. long—were on a separate plant.



Aulax pinifolia

(photograph Douglas Elliott)

This member of the *Protea* family, is a native of South Africa and, like so many proteas and South African plants, likes a sunny, open position. It grows 4 to 6ft. high. It is not new, having been introduced into England in 1780. At least one New Zealand nursery can supply plants.

NOTES FROM THE CHRISTCHURCH BOTANIC GARDENS

L. J. METCALF, N.D.H. (N.Z.) (Assistant Curator).

In a previous issue of *New Zealand Plants and Gardens* it was mentioned how, in Christchurch, the weather seemed to be always intent upon breaking records of one or more of its aspects. From the behaviour of the weather to date, this year will be no exception. In common

with most of the eastern half of the South Island, we are experiencing our driest year since 1915 when only 15.69 inches of rain fell. So far this year we have recorded only 13.87 inches of rain and, with an average of 4.20 inches of rain to be expected within the next two months, the prospect is not very bright. The amazing thing is that, in spite of the overall dry conditions, most things have this year been every bit as good as in previous years, and the soil in parts is still surprisingly moist underneath. The flowering displays in particular have been excellent and, providing conditions do not drastically worsen, the summer displays should also be of a high standard.

In most of the larger centres of New Zealand natural areas of native plant vegetation usually exist to a lesser or greater degree throughout their urban areas; or there are usually relatively large areas of bush quite handy so that at all times the inhabitants of those towns are more or less conscious of the presence of native plants. However, in Christchurch the position is somewhat different, for here the city was established on what was an almost treeless plain. The only native bush anywhere near the town was the Riccarton-Papanui bush, now reduced to an 8 acre remnant at Riccarton, and a fairly extensive bush covering on Banks Peninsula, which was for the most very quickly cleared or destroyed.

When the first settlers arrived in what was to be the town of Christchurch, the landscape was very barren and quite different in appearance to the Canterbury Plains of today. The shelter belts of pines and other introduced trees did not exist, there were no pastures of introduced grasses, nor had the land been broken up for other crops. Instead, the site of the future city was more or less swampy, with beds of shingle and sand dunes arising in various parts, and the little river Avon, at that time known as Teonotopo or Potoringamotu, wound its way through a thick growth of flax, niggerheads, and raupo. To the west of the town area the land gradually rose and was largely covered with silver tussock (*Poa caespitosa*), with occasional patches of *Discaria* and bracken in shingly or sandy places, and some *Phormium* in the damper spots. Such was the appearance in the early days of what was to be Hagley Park and the Botanic Gardens.

Within a very short period of time South Hagley Park had been partially levelled and sown down, while later work in the Botanic Gardens and North Hagley Park ensured that the character of the vegetation was completely changed. Much of the existing native plant covering was swept away, and most of the remaining native vegetation disappeared before the invasion of introduced pasture grasses and other plants, so that today very few native plants are to be found growing naturally in either the Park or the Gardens.

We are very fortunate that in 1864, before the Park had been greatly disturbed, J. B. Armstrong compiled a list of the native plants to be found growing throughout this area. This list includes more

than 80 different plants, very few of which are now to be found. It is interesting to note that no trees were recorded and even the ubiquitous cabbage tree (*Cordyline australis*), which occurred in nearby Riccarton Bush, is surprisingly absent. He records 6 shrubs, none of which is to be found growing naturally within the confines of Hagley Park and the Botanic Gardens today. The only possible exception is the karamu (*Coprosma robusta*) which has re-established itself around the New Zealand section and occasionally other parts of the Gardens. *Leptospermum scoparium* was recorded as a few in the Gardens area, the matagouri (*Discaria toumatou*) on the dry shingly spots, tutu (*Coriaria ruscifolia*), the name is as given by Armstrong, in patches along the river, *Olearia virgata,* as a few in the Gardens area, and the koromiko (*Hebe salicifolia*), as common along the river bank.

One interesting plant mentioned on the list is *Clematis marata* which was recorded as being abundant in the *Discaria* scrub. When this *Clematis* was in flower the surrounding air must have been quite heavy with its sweet perfume. Unfortunately by 1918 the *Discaria* had disappeared from the scene and of course along with it the *Clematis.*

Some of the plants recorded by Armstrong are unusual inasmuch as one would not expect to find them growing in this area, and doubt has sometimes been cast upon either the correctness of his identifications or his integrity. However, it must be remembered that in 1864 J. B. Armstrong had been in New Zealand for no more than two years so that his knowledge of the flora must have been remarkable for one who had been in the country for so short a time, and if he made a few mistakes with his identifications then he is not to be discredited on that account. The sundew, *Drosera binata,* was recorded by him as growing in the swamp in North Hagley Park and while it may have been in error we cannot definitely say that it never grew there. Similarly *Chrysobactron hookeri* was recorded as growing along Washbourne Creek in South Hagley Park, and here again it is by no means certain that it never grew there. The parsley fern (*Botrychium australe*) was apparently common in parts of the Park and T. H. Potts mentions the fact that some very handsome examples were obtained.

While much of the native plant cover was destroyed at an early date, it is interesting to note that as late as 1905 plants such as *Aciphylla squarrosa, Raoulia monroi, Cyathodes frazeri* and *Muehlenbeckia axillaris* were still growing within the Park.

The next more or less complete survey of the indigenous flora of Hagley Park and the Botanic Gardens is a list compiled by Arnold Wall in 1918. In it only 35 native plants are recorded as growing within the Park, with another 5 listed as growing in the immediate vicinity. Most of the principal plants have disappeared and other plants have been reduced in some cases to one or two specimens. There are a few changes on the list, and some of the plants recorded by Wall do not appear on Armstrong's list. One plant of *Carmichaelia*

violacea is recorded by Wall, who also records a number of species of *Gramineae, Cyperaceae* and *Juncaceae* not mentioned by Armstrong. The very nature of the uses to which Hagley Park and the Botanic Gardens are put has ensured that the native vegetation has been almost completely exterminated by introduced plants, and as one writer put it, 'It is astonishing, not that we have so few native plants still remaining in our Park, but that we have so many.'

The intensive cultivation in the Botanic Gardens and the rich covering of grass throughout Hagley Park might be regarded as sufficient barrier against the establishment of natives within these areas, but it is surprising how many native plants have managed to accustom themselves to the changed conditions. Around the lakes in the Gardens *Blechnum procerum,* and the niggerhead (*Carex secta*) have re-established themselves and appear spontaneously at every opportunity. The *Blechnum* is also to be found growing along the bank of the creek in the Woodland. *Pratia angulata* is to be found growing in one of the lawns in the Gardens and *Cotula squalida* is well established on several of the lawns, as is *Hydrocotyle novae-zelandiae.*

Quite recently one of the native orchids (*Chiloglottis cornuta*) was found to have established itself in one part of the Gardens. This species has never been recorded on any previous list, and its spontaneous appearance in the Botanic Gardens is extremely interesting. *Epilobium nummularifolium* is still present and *Carex ternaria* is fairly common along parts of the river bank and around Victoria Lake. Occasional plants of *Acaena viridior* are to be found along the bank of Washbourne Creek. Both *Blechnum pennamarina* and *B. fluviatile* are found sparingly along one of the shady creek banks and both of these ferns were not recorded by earlier botanists. This list of plants is not exhaustive and possibly an intensive search will reveal a few more species. It does show, however, that even in places such as the Botanic Gardens and Hagley Park, certain native plants are able to establish themselves in spite of the conditions being very much against them.

NOTES FROM DUNEDIN

R. W. BALCH, N.D.H. (N.Z.).

With the coming of spring each year, the place that trees play in the appearance of our towns and cities is more noticeable than ever. In streets and suburbs in Dunedin, where deciduous trees are growing in large numbers, many pleasing pictures are formed with their blossoms and fresh young foliage. The evergreen trees, with their duller foliage, are very useful as a foil and background, as well as being so necessary for their habit and form. The contrast with those parts of the city which are comparatively treeless is very marked indeed. In Dunedin this is particularly noticeable in spring and autumn, and possibly to a slightly lesser extent at other times of the

year. The presence of large areas of native bush on reserves, almost in the heart of the city, is a unique feature for a place of its size. Many large exotic trees, both deciduous and evergreen, on parks and reserves also play a vital part in giving this natural landscape effect around groups of public and private buildings. Unfortunately, as in any city, there are large areas which are almost treeless. These, when viewed from a vantage point, are a sea of roofs and chimneys, unrelieved in any way and so much less pleasant to look upon, to pass through, and to live in. The reasons for this difference are quite obvious, but the remedy it not. It is where parks and reserves are very small, or conspicuous by their absence, where streets are narrow and building sections small, and housing built closely together, that these treeless areas are found. Unsuitable subsoil and local climatic conditions also have an influence on the presence or absence of trees.

The tree population of a town is not to be taken for granted. It is not a simple thing to retain many of the fine specimens that grace an urban area, and to ensure that by constant replanting and extended planting their numbers increase and keep pace with a growing and expanding city. The continual modernising of towns and cities is often to the detriment of health and vigour in trees, and at times leads to their displacement altogether. Established trees in urban areas create their own particular problems, too. Footpaths can be made uneven and dangerous by large surface roots breaking up the pavement; fallen leaves block mudtank gratings and spoutings, causing minor flooding in heavy downpours. Fine roots penetrate faults in foul sewers and stormwater drains, sooner or later blocking pipes. Suckers, due to root damage and severe top pruning, come up on roadsides and in private gardens. Interference with power lines, giving rise to short circuits, faults in telephone services, excessive shade and danger from falling branches in stormy weather, are all frequent reasons for complaint. Owners of cars who park under overhanging street trees object at times to bird droppings disfiguring and damaging paintwork, and also to similar effects from honeydew falling from aphis infested foliage. Civic authorities are constantly having to deal with complaints of this nature.

The removal or mutilation of trees is always going on in order to reduce these often justifiable objections to the minimum. Street accidents and the continual building of home garages, with the necessity for a channel crossing, cause casualities to street trees as well. The steady advance of asphalt, and the complete sealing of streets from one side to the other, has led to the weakening and death of many fine trees through thirst and suffocation — trees which were originally planted in grassy margins in far more congenial conditions. Also extensive areas of sealing leads to increasing loss of rainwater which, instead of penetrating the soil, is collected by channelling into storm water drains and directed into rivers or the sea. The effect of this loss of water must be considerable on slopes and banks.

The provision of trees in towns comes about in several ways, public gardens, parks and reserves playing the most important part. The grounds and areas surrounding hospitals, schools, colleges, universities, churches, cathedrals and other public buildings, and business premises, have quite an important effect as well. Trees in streets and avenues can have a major part to play, too. All these together form the framework and background for the overall landscape effect of the trees of a city. Linking these together to make a really verdant and attractive centre in which to live are the countless trees and large shrubs of private gardens. The overall effect in a residential area, where most gardens are well planted, is very considerable indeed, for it is with the shelter, good conditions, and protection from the public, in the private garden, that the choicer ornamental plants can be grown at their best.

Some people, in particular those whose properties or possessions are affected in some comparatively minor way by the presence of nearby trees, feel there is little place for them in a modern city. This attitude can be present also among those whose job it is to keep public amenities functioning well — amenities such as power supply, telephone and alarm systems, transport, drainage and lighting. For contractors, of course, engaged in demolition and rebuilding, subdivision, and road works, existing trees are a curse and an abomination. In other countries, especially in the cities of Europe and America, rather more care is taken in the retention of existing trees when rebuilding takes place and when streets and roads are altered and subdivisions made. In New Zealand the emphasis is more on making a clean sweep of existing features, and completely new landscaping and planting resorted to afterwards. This certainly has its advantages, but there can be a distinct loss of mature trees for many years, because the expense entailed in transplanting large specimen trees is very considerable. Public opinion and campaigns in the Press, on the cutting down or not cutting down of trees, is not always a sure guide to the best decision. Often the greatest outcry for the saving of a tree or trees can be in an instance where felling is the obvious course in the public interest. In other cases, the felling of trees which is purely and simply vandalism of the highest order passes unnoticed except by those who are in a position to realise the truth.

There are many good reasons, for the people who live there, why there should be trees in towns. The foremost and most obvious are aesthetic. Surely it is better for the human spirit and human relationship to live in beautiful surroundings, even though we may tend to take them for granted. It must have a good effect on health and happiness. There are purely practical reasons as well: they give shelter from winds, afford shade in hot weather, and bring birds to the heart of a city: they act as dust filters, helping to cleanse the air. An important factor for peace and quietness in this mechanical age is that in a very substantial way they form barriers to noise.

Some of our present day tree problems have been caused by the type of tree planted in earlier days, and others by where they were planted. It is very easy to be wise afterwards, but not so easy at the time, but there is more to it than that. Many of our finest trees in public places must have been planted before power poles and overhead wires were even thought of. Some reserves have been cut up by roading, and large estates subdivided and re-subdivided over the years. It has been the changing character of towns that has made many trees which were well chosen, and well sited at the time of planting, the problems they often are today. We should tend to thank the men who planted in the past rather than condemn, and seek to learn from their efforts.

The planting of street trees in towns today is greatly restricted; suitable types of trees, and favourable positions, are very limited. The protection that can be given in the first few years is not very much. There should be better opportunities in the foreseeable future, but they must be planned for; they will not just happen of their own accord. The gradual replacement of overhead wires by underground cables must come, but what is gained in headroom can quite easily be offset by greater restrictions to root run unless underground services are kept clear of tree planting sites. If planning authorities could be persuaded to plan future housing areas and subdivisions, allowing for the planting of groups of trees and specimen trees that could be left to grow naturally, it would be a happy day for city dwellers in those new areas. In Dunedin, in particular, most of these new housing sites have a number of no-exit streets with a turning circle at the end. If by reducing the overall road width, or even by sacrificing several building sections, these turning circles could be made large enough to permit a central turfed area of from fifty to one hundred feet in diameter, what an ideal place would be formed for an informal group of trees. They would be far enough away from houses not to cause troubles from roots, excessive shade, and leaf fall, neither would they interfere with lighting, traffic, overhead wires and drains. The protection that could be given from damage in the vital early years would be much greater. Groups of trees such as this would give a far more satisfactory effect in every way than the usual formal lines of mutilated street trees.

Private property owners can do a great deal to increase the numbers and quality of trees in towns, to the benefit of all. The cumulative effect of just two or three small growing trees, or large growing shrubs, planted near the roadline in each front garden, could be very good indeed, and I feel strongly that this is the real way to beautifying streets when well done. Whether civic authorities, and interested societies, can assist in this object could be a matter for investigation.

NOTES FROM PUKEKURA PARK

A. D. JELLYMAN, N.D.H. (N.Z.) (Assistant Curator)

A feature that people always look forward to enjoying in parks and other public places is the enviable splash of colour furnished by displays of bedding plants. Whilst the bedding of flowers is carried out on basically the same principles from North Cape to the Bluff, climatic conditions do set the limits of the varieties which can successfully be grown in any one area. Besides the basic principles of planting being identical, so too is the period of display. Thus generally there are two main displays each year, one during the spring months, at its zenith in late September and October, and another designed to reach a peak in January and carry over until April. In some cases preference is given to planning a continuous succession of colour from bed to bed, but in public parks I would consider this uncommon. However, such a system is carried out in our local hospital grounds quite successfully.

My intention in this article is to give an evaluation of the various plants we bed out in our parks and the treatment they receive. Digressing for a moment, I must hasten to explain that our bedding is planned for planting in the last week of April and first week of May for spring display, and for summer, the first two weeks of November. This means sowings from January till March and from August till October for the respective displays.

For spring display considerable use is made of the *Calendula,* particularly for open street plots where there is free air movement and little possibility of shading. Under such conditions the plants grow sturdily, flower freely and are relatively free of the mildew which will attack them should extraordinary wet weather prevail. Being a rapid growing plant from seed, it is essential that the plants should be transplanted whilst in active healthy growth and before they become stunted. *Cheiranthus allionii,* sometimes called Siberian Wallflower, is one whose seed needs to be sown early in January to obtain a display by October. It does better here in a cool, slightly shaded bed and can be used quite successfully as a 50 per cent. mixture with forget-me-nots. Since *Cheiranthus allionii* flowers so late, we usually interplant it with an earlier tulip which provides a succession of colour. Another that revels in a semishaded bed is *Cineraria* 'Nana Grandiflora'. For this plant we give a fairly rich soil and with the risk of frost being relatively remote, plant out in early May. If fresh growth can be secured after planting before the colder portion of our winter arrives a first class display can be looked forward to, pending the absence of frost. Cinerarias seem to resent too much overhead drip from trees so I prefer to grow them in relatively open beds. Attention must be paid to spraying during the spring for leaf miner and the caterpillar of the magpie moth or 'woolly bears' as we used to know them.

Pansies are favourites with everybody and we use them as a carpet for tulips or irises. To grow well, pansies like open sunny beds, but tend to fall victims of a disease, similar to grease spot of passion-fruit in wet weather, and lose their vigour. A series of self-coloured plants have been very impressive under our local conditions—blue, golden, orange and 'Snow Cream' are all pure colour strains of vigorous growth, whilst 'Clear Crystals' appears to be a mixture of these varieties and stands out from the distance largely because of the numbers of white ones in it.

The Iceland poppy, *Papaver nudicaule*, is perhaps the most rewarding of all spring display plants to grow. Given a rich soil and an early start (planted late April), their display can extend from a humble beginning in mid-July until November, or such time as they have to be removed for the next bedding display. The earliness of display is dependent on how ruthless one is regarding the removal of the first buds before they flower, to build up a stronger crown. Should you consider at any date that crown is strong enough to launch into its exhausting display then you may let it flower to your heart's delight, but I myself like to stop them for at least eight weeks after planting and even longer if circumstances warrant it. A variety called 'Champagne Pink' is top of local polls at present and is a robust grower of pastel pink shades without any wide variation but remarkably spectacular in a bed. For a continuous display both poppies and pansies must have spent blooms removed regularly, so it is a good habit to make this a weekly chore. Not only does it keep the plants flowering freely, but improves the overall appearance of the bed.

To grow polyanthus well for display you need to incorporate ample organic manure into the bed several weeks prior to planting. Plants for display may be raised from seeds sown in early December or plants divided at the end of the previous season and grown on. We practise the latter method quite successfully from year to year. In the spring when the displays are removed the clumps are divided, the leafy tops cut back and lined along the nursery rows in the shade of young trees. There they remain till autumn, when they are wrenched on both sides three weeks prior to planting. When needed, the plants are lifted and transplanted. Where clumps are quite large it is often worthwhile to divide them further as this gives a vigorous plant and better quality flowers. Apart from periodic topdressings of blood and bone during the growing season and removal of finished flowers, polyanthus demand little other attention.

Primula malacoides comes in numerous forms, and lately in two vigorous double flowered forms, both pink and white. Whilst normally these plants would do well in lightly shaded conditions, this year wet conditions have precluded successful displays in such situations. Nonetheless beds in sunny open positions have been most rewarding and, by preparing the beds well with organic matter in advance of planting, vigorous long lasting displays have been seen.

If plants can be seen in active growth after planting, but before the cooler weather comes, ten week stocks will make a good display over a couple of months. In 1963 our plants were in by April 28th and had sufficiently warm weather in May to be growing vigorously when the weather cooled down. From this planting we were rewarded with a grand display. With stocks, occasional sprayings with thiram should be made, particularly at the seedling stage, to prevent attacks of powdery mildew. For bedding there are a group of dwarf ten-weekers available in separate colours which are sturdy growing plants attaining 15 inches in height.

To secure an October display of Sweet William, seeds must be sown during the first weeks of January and grown on in seed trays until planted. Fortunately, they seem to be tolerant of long stays in seed trays and don't become spoiled by it. Compared with other spring display crops, the flowering period is rather short and lasts little over a month, but by interplanting with tulips or irises a successional display can be achieved. In the taller varieties separate colour strains can be obtained, of which 'Scarlet Beauty', I think, is outstanding, and good mixtures are also useful. Besides these there is that useful variety, 'Indian Carpet', the dwarf one that forms small mounds, excellent for edgings.

South Africa contributes a most colourful daisy to our spring display in 'Star of the Veldt', *Ursinia anethoides*. These plants require a sunny well drained position, form dense individual plants of finely pinnate foliage and give a prolific display of 2-inch wide daisy flowers in colour range of yellow and orange pastels. The overall height of *Ursinia* is 18 inches. If you know what the annual *Dimorphotheca aurantiaca* looks like, just imagine a plant slightly smaller, with similar flowers produced in greater numbers and you have *Ursinia*.

Anemones and *Ranunculus* are both used quite extensively, the former in edgings and the latter for main display. Both prefer open sunny positions and need to be planted before the cold weather comes if a useful display is to be achieved. For anemones we plant corms directly into the beds and usually soak them in water overnight before planting. *Ranunculus*, however, are started in seed trays under glass three or four weeks before planting out. Of the anemones, the single flowered strains appear to be the more vigorous and single coloured varieties such as 'The Bride', 'Scarlet Emperor' and 'Blue Bonnet' can be used to good effect.

Tulips always make a feature in any spring display and give height to otherwise flat beds of pansies and Sweet Williams. In our soil bulbs are planted 6 inches deep in May and the earliest are showing through by July. Attacks from aphis during the flowering stage are not uncommon but are easily overcome by an insecticidal dust. The only other ailment that occurs during the wet weather is a fungoid spotting on the leaves and flowers. Of the numerous

varieties available, the most successfully grown here are 'Aristocrat' (early), 'Grullemansii' (early), 'Niphetos' (best early variety, withstanding the most inclement of weather), 'Harry Veitch', 'Mrs. J. F. Scheepers', 'Clara Butt' and 'Golden Age' (all last four varieties are late September and October flowering).

Summer bedding plants give a greater range of material to utilize and it is in this season that one can fully extend the imagination of plant combinations and designs. Nevertheless the spring displays always have their charm and are an everlasting source of satisfaction to their designers (when things go right) and to the public.

PUBLICATIONS RECEIVED

WILD FLOWERS OF THE TRANSVAAL, by R. A. Dyer, Inez C. Verdoorn and L. E. Codd. Reproductions of hand coloured drawings by Cynthia Letty. Published by the Trustees, Wild Flowers of the Transvaal Book Fund, 1962.

To the horticultural bibliophile a good collection of works dealing with the floras of many parts of the world is a highly prized possession. He can add the one under review to his collection with a feeling of especial satisfaction. It is, in every way, a most desirable volume both from the point of view of format and contents.

South Africa is a great storehouse of horticultural wealth. Consequently it deserves a literature in keeping. For over thirty years there has appeared annually the beautifully produced *Flowering Plants of South Africa,* with coloured plates of equal quality to those of the famous Curtis's *Botanical Magazine.* Companion volumes to *Wild Flowers of the Transvaal* are *Wild Flowers of Natal* by Mairn Hulme and *Wild Flowers of the Cape of Good Hope* by Elsie Garret Rice and R. H. Compton, but the book under review is a superior production. Unlike so many books of this character, this has been produced entirely in South Africa. The colour blocks and the printing throughout, and the binding are wholly South African and the production is equal to anything of its kind produced in Britain, Europe or America, and superior to many.

The coloured drawings form the most attractive feature of this flora. They are the work of Cynthia Letty, South Africa's greatest floral artist and comprise 174 full page plates. These embrace 82 families, 282 genera and 423 species, all of which are illustrated in colour. There are, in addition, pencil sketches of a few others. The sequence used in Phillips' *The Genera of South African Flowering Plants* (1951) has closely been followed. The name of the family in question heads each page. The specific name is followed by that of the botanist who first described the plant. Common names have only been included if they are widely used. There are separate indexes for both botanical and common names. Botanical terms have been reduced to a minimum and the ones used will be familiar to most horticulturists. The text has been arranged as near as possible to the corresponding illustrations, and is fully descriptive.

There is a foreword by Dr. H. M. L. Bolus, of Bolus Herbarium, University of Cape Town, a list of sponsors and subscribers and a preface by Mr. John Voelcker, Chairman of the Board of Trustees.

This review does scant justice to this magnificent book, which should be on the shelves of every horticultural library. This applies especially to New Zealand where so many South African genera respond so well to our climatic conditions.

PROTEAS, Know Them and Grow Them, on the Cultivation of the South African Proteaceae, by Marie Murray Vogts, B.Sc. Published Afrikaanse Pers-Boekhandel (Edms.) BPK. Johannesburg.

Mrs. Vogt is an acknowledged authority on the South African *Proteaceae* and the foreword by Professor H. B. Ryecroft, Director of the National Botanic Gardens of South Africa, Kirstenbosch is a guarantee of this book's reliability. In it he states 'Mrs. Marie Vogts has now given us the benefit of her experience in growing these plants, systematically and intelligently gained over a period of twenty years.'

In this excellent publication the illustrations will have an instant appeal, starting off with an excellent reproduction of *P. grandiceps* in colour, doing full justice to this beautiful, but scarce species. There are other excellent colour photographs of *P. cynaroides,* rather more red than I have seen in New Zealand gardens, *P. latifolia, Leucospermum reflexum, L. conocarpum, L. nutans, Leucadendron daphnoides, Mimetes lyrigera.* There are also many photographs in half tone. This is a quarto volume of over 200 pages and it contains the fullest information about proteas, leucospermums, leucadendrons, *Serruria* and allied genera. Their cultivation, propagation and use in the garden scheme contains much information that cannot but be most helpful to all who would grow this fascinating family.

Many of the *Proteaceae* grow remarkably well in many New Zealand gardens, but they can be grown even better if some of the guidance in this most useful book is taken.

GARDEN SHRUBS AND THEIR HISTORIES, by Alice M. Coats. Published Vista Books, London, 1963.

In her previous book *Flowers and Their Histories,* Miss Coates gave, in most interesting detail, the histories of the origins, discovery and introduction of many of our herbaceous and bulbous plants, both annual and perennial. Its success made us all the more interested to see the publication of her later book *Garden Shrubs and Their Histories.* This is a worthy successor to her first book. In all, 110 shrubby genera are dealt with. The origin of the names are given, their early legendry history, their careers as garden plants, some far back in the distant past as the Camellia (516 A.D.) and the first record of a cultivated rose in England (1087-1100 A.D.), others discovered by plant hunters during the past century and introduced to cultivation.

This book also contains brief biographies of botanists and plant hunters, horticultural scientists, famous horticulturists, nurserymen and others whose work has contributed to the present high standard of horticulture. There is an index of English and American plant names. The book is nicely illustrated in colour and half tone and is indispensible to the horticultural bibliophile who wants to know something more about his plants than their cultivation and employment in garden schemes.

A SUPPLEMENT TO ELWES' MONOGRAPH OF THE GENUS LILIUM, Part IX, by W. B. Turrill, O.B.E., D.Sc., F.R.S., F.L.S., V.M.H. Illustrated by Margaret Stones with 5 full page plates coloured by hand. Edition limited to 40 copies. Published by the Royal Horticultural Society, London, 1962.

Parts I to VII of this supplement were published during the years preceding the Second World War and, during the air attacks on London, many were destroyed. These have, consequently, become very scarce. It is now being continued, parts VIII and IX having already been published with beautiful full sized coloured drawings by Margaret Stone and a description of each species given. The species of *Lilium* illustrated and described in this issue are *L. washingtonianum* var. *purpurascens, L. pitkinense, L. pardalinum* var. *giganteum, L. kelleyanum* variant, *L. nanum.* This is a work for the horticultural bibliophile. There is a larger printing of an edition with plates in colour lithography.

DOMINION CONFERENCE

1965 ANNUAL DOMINION CONFERENCE
of the
ROYAL NEW ZEALAND INSTITUTE OF HORTICULTURE (Inc.)

NOTICE IS HEREBY GIVEN that the forty-second Annual Meeting and Conference of Delegates of the Royal New Zealand Institute of Horticulture (Inc.) will be held in the Red Cross Hall, London Street, Hamilton, on Thursday, 18th February, 1965, commencing at 9 a.m.

THE BANKS LECTURE will be delivered at 8 p.m. on 18th February by Mr. E. W. E. Butcher, M.A., of Hamilton, and will be entitled 'Some Remarkable Plants of the Waikato Bogs'.

BRIEF PROGRAMME:

17th February Social evening at 21 Awatere Avenue (Home of Mrs. D. M. Yendell).
18th February Conference and Banks Lecture
19th February Outing and Gardens visit

Members of the Institute and delegates from affiliated organisations are specially invited to attend this Conference. The Waikato District Council is planning arrangements for the complete comfort and enjoyment of visitors. The day session of the Conference will conclude with an address by Mr. S. Challenger of Lincoln College on 'Impressions from America and the Continent.'

Rail, steamer and Air Concessions (10% reduction) will be available to delegates (dependent upon minimum numbers using) upon application to the Dominion Secretary.

Those attending the Conference are strongly advised to make early hotel reservations direct with the hotel of their choice, and to inform the Waikato District Council (P.O. Box 415, Hamilton) of their hotel.

Hotels		**Tariff**
Commercial	Victoria Street	Daily 63/-
Frankton	Commerce Street	Room 38/6-43/6. Double 63/-
Hamilton	Victoria Street	BB 45/-
Riverina	cr. Clyde & Grey Sts.	Room 45/- to 50/-. Double 75/-
Royal	Grey Street	47/6 daily
Abbotsford House	6 Angelsea Street	DBB 30/-
Bridge Pvt. Hotel	2 Bridge Street	DBB 30/-
The Pigeons	100 Clarence St.	BB 27/6
Grand Central	Hood Street	BB 22/6
Parklands	24 Bridge Street	BB 22/6
Warwick Pvt. Hotel	407 Grey Street	BB 25/-
Belle View	14 Victoria Street	Bt 20/-
Riverview	20 Victoria Street	Bt 20/-
Motels		
Mahana Motel	265 Great Sth. Rd.	30/-
Motel Whitiora	39 Ulster Street	30/-
Kingsfield Lodge	Ohaupo Road	30/-
Tamahere Motels	Cambridge Road	60/-

K. J. LEMMON,
Dominion Secretary.

Royal New Zealand Institute of Horticulture (Inc.)

APPLICATION FOR MEMBERSHIP

I hereby make application for membership of the Royal New Zealand Institute of Horticulture, Inc., and agree to abide by the conditions and rulings of the Institute.

Enclosed herewith please find the sum of ..... in payment of the first year's subscription.

Subscription Rates (renewable annually from date of application:)

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PERSONAL DETAILS:

Full Name .....

Address .....

.....

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Occupation .....

Date .....

Signature .....

This form should be completed and forwarded with accompanying remittance to The Dominion Secretary, Mr. K. J. Lemmon, Suite 1, First Floor, 10 Brandon Street, Wellington, C.1., or your nearest District Council Secretary.

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