Notes on the cultivation of some New Zealand native plants in a Wellington suburban garden

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INTRODUCTION

This wind swept Wellington hillside has been transformed into a botanical garden containing mainly native plants. There is a particular emphasis on alpines ... (New Zealand's Open Garden Scheme 1995–96). We feel that this quotation rather neatly sums up our struggle over a period of forty years to transform a rather mean piece of Wellington real estate into the botanical garden it is obviously perceived by some observers to be today (Fig. 1).

Figure 1. View of the garden.

Our property is situated in the high hills just east of the Ngauranga Gorge. It is approximately 1000 m^2 ($^1/_5$ of an acre), has typically steep rolling hill slopes and is very well watered with a small stream conveniently dissecting the property. Wind swept it certainly is by the prevailing northerly. The impact of the less frequent southerly is much reduced, for even in a severe mid-winter storm the surrounding hills largely deflect its heaviest gusts.

Once part of a long vanished town milk supply farm 'Newlands Dairy Ltd', the property presented a daunting prospect on our first viewing of it. One November evening 53 years ago, in the full force of an equinoctial northerly, roaring up the long valley of the Kenepuru stream off Cook Strait, we looked with dismay upon a most unattractive expanse of wind flattened grass, two battered clumps of pampas grass and some rather ill looking tauhinu that had apparently decided a long time ago to wisely adopt a very prostrate growth habit in order to survive. Unable to stand alone we clung to each other for support and with much apprehension viewed our future home and garden.

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A detailed account of the evolution of our property from such a bleak and unpromising beginning to its present 'botanical' status lies outside the scope of these notes. It will immediately be evident to those who have established, or who have attempted to establish, any plants in such conditions that to firstly create and then maintain such an enterprise requires both physical and mental effort over a long period of time.

W. B. Brockie wrote: 'the study of our native plants... is one of the healthiest of pursuits and one calling upon the individual for physical and mental resourcefulness' (Brockie 1945). Brockie was referring specifically in this passage to the field study of our native plants. Our own experiences and observations in establishing, maintaining, and studying these plants in cultivation entirely confirm Brockie's observations.

Among the objectives of the Wellington Botanical Society are: 'to encourage the study of botany in all its branches, and the New Zealand flora in particular; to create an interest in and foster an appreciation of native plants especially in the field and to collect and disseminate knowledge and *encourage the cultivation of native plants*' (Wellington Botanical Society n.d.). We will attempt in the following notes to specifically address these two latter objectives.

We have felt now for some time that the Society as a whole has either largely forgotten or given up on the last item in its statement of objectives. We hope therefore that this brief record of our experiences and observations will encourage and persuade more Bot. Soc. members to cultivate these unique plants, and then share their observations with those many people throughout New Zealand now so very concerned with native plant conservation and also with the exciting potential for the horticultural use of these plants in their country of origin.

We would like to emphasise that each of the plants discussed later has been grown by us on this property. Unlike some 'how to grow' books we do not claim to answer the many problems confronting those few attempting to grow the more unusual members of our native flora. We record our own experiences of growing them in this particular, not entirely ideal, environment in quite specific conditions which may differ greatly from other areas of Wellington where, we realise, problems quite different from those that confront us will from time to time arise and have to be overcome. But we hope that our efforts and the results so far achieved will act both as a guide and an encouragement to those wishing to take up the challenge of cultivating some of our more difficult native plants.

Some members will no doubt find the use of the word 'alpine' in the text rather difficult to come to terms with if one uses that term to define a plant growing naturally in the high mountain regions. In horticultural terms however, the term 'alpine' is used rather loosely to classify plants that can be grown successfully in either a rock or alpine garden. The natural range of these plants can be from sea level to high alpine. The natural range of each plant described will be made plain in the text.

Questions regarding the most successful type of soil or growing medium for the different plants will also, we hope, be answered in these notes. However, in general, we have achieved satisfactory results with a 'scree' mix used and recommended by W. B. Brockie. In fact we feel that we could conclude this introduction in no better way than to quote W. B. Brockie again: 'Nearly all of our mountain plants can be successfully grown in a rock garden, and they need only attention in providing suitable soil, drainage, moisture and shade...'.

'In warmer and sunnier parts of the country a southern aspect for the New Zealand alpine garden is desirable, but a perfectly level bed attractively studded with well placed rocks is quite suitable. Good drainage is essential in every case ... almost every one of our mountain plants, even bog plants will grow well in what is known as a scree mixture' (Brockie 1945).

Brockie then proceeded to give his scree mixture recipe. One major difficulty with this mixture is that he recommended as one ingredient two barrowloads of upland pasture. Therefore instead of quoting his recipe in full we set out the scree mix we use now which is closely similar to Brockie's original mix:

> 3 parts quarry mix (or builders mix) + 3 parts 2 cm road chips + 1 part leaf mould (or substitute[2]) + 1 part very clayey soil or fine, dry, yellow clay (N.B. avoid 'blue' clay, i.e., clay saturated with stagnant water).

Fertilizer of any kind should be used only sparingly. The best is bone flour applied in spring and early autumn. There is also merit in some of the slow release granulated fertilizers. Now to quote Brockie once more: 'These ingredients should be thoroughly mixed together. The quantity of scree material required may be estimated by allowing for a depth of one foot over the entire area to be covered' (Brockie 1945).

We will now move on to set out the results achieved using Brockie's methods. We hope that others will be encouraged to attempt to cultivate a somewhat wider selection of our native flora than is usually the case in Wellington gardens.

CELMISIA SPECIES

An article published in the Bulletin of the Alpine Garden Society (England) and reprinted in the New Zealand Alpine Garden Society Bulletin stated: 'New Zealand mountain daisies in cultivation thrive where summers are cool and there is a plentiful supply of moisture in both soil and atmosphere ...' (Anon. 1996).

It will at once be appreciated why there are problems in successfully cultivating these plants north of about Timaru in 'lowland' conditions. Despite these difficulties it seems from our observations that most growers of New Zealand plants attempt sooner or later to cultivate one or more of these truly beautiful mountain daisies in their own gardens.

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[2] Leaf mould may be very difficult to obtain. Use as a substitute homemade kitchen compost or any good organic compost.

Many are the failures and disappointments experienced by those attempting this task. It appears that growers will make the mistake of trying to grow the larger and more striking looking species such as *Celmisia semicordata, C. traversii, C. verbascifolia* and *C. coriacea* (formerly *C. lanceolata*) to name but a few. Our experience is that it is essential to begin any attempt to grow celmisias by cultivating one or more of the easy lowland species, and if possible by observation in the field, learning from the accumulated knowledge of botanists and/or growers of the more difficult species. It is also necessary to learn the hard lessons from the occasional failures (even with easy species) to achieve one's ambition of bringing to flower *C. semicordata* and its more difficult companions in Wellington conditions.

We have listed above some of the species to be avoided by the beginner. It should however be possible given some shelter in the form of a good sized rock, tussock, close ground cover or the provision of a deep scree bed, to grow any of the following: *C. lindsayii, C. holosericea, C. mackaui, C. monroi* (some varieties of which descend to sea level in Marlborough) and the West Auckland variety *C. major* var. *major* (now regarded as a variety of *C. gracilenta*).

If success is gained with any one of these varieties it is time then to attempt a few of the truly alpine species; *C. bellidioides,* an inhabitant of waterfalls in dark damp mountain gorges, is surprisingly amenable to cultivation as is *C. spedenii* from West Dome in northern Southland, and also *C. angustifolia* from mid-Canterbury, and *C. incana* with a wide distribution in both islands. We have grown all these plants at one time or another, and we have found that the changes in cultivation technique necessary to grow the alpine species are not too many or complex.

Despite considerable effort and experimentation with these different techniques our results with the difficult species have, however, been very patchy indeed. One would have to say the jury is still out on the feasibility of growing them outside in garden conditions in Wellington. Growing these plants as pot specimens or in an alpine house is perhaps best of all in our conditions, but such methods are outside the scope of this article which is mainly concerned with garden cultivation.

To conclude, perhaps a few 'do's and don'ts' would be helpful to those wishing to take up the challenge:

- Do plant all the *Celmisia* species in semi-shade, remember 'head in sun, feet in shade' for many New Zealand plants.
- A cool, damp, deep root run must be provided.
- A good deep mulch of rocky material plus appropriate ground covers (see later in these notes for useful ground covers) ensures cool root conditions, particularly important in summer.
- Feed with bone flour, or sparingly with slow release fertilizer.
- Don't mulch or feed with animal manure.

- Do not overuse bark or peat in your soil mix. A well matured organic compost is a more than adequate substitute. There are, however, a few very good bark-based potting mixes which give excellent results when growing alpines in pots. These few mixes have produced outstanding results with our pot-grown plants.
- Don't use chemical garden fertilisers.
- Never allow the soil in which these plants grow to become too dry—rapid death will result. In periods of dry weather or drought, regular *deep* watering is essential.

Without doubt the greatest success horticulturally with *Celmisia* has been achieved (sadly) overseas in Ireland and northern Scotland. Reports have it that they grow better in gardens there than they do in their own native mountain habitats! As we are not likely to be able to reproduce the cool, damp climatic conditions experienced in Ireland, it appears we will have to continue to endure the good natured derision of the Irish when they observe our distinctly second rate results with these wonderful but frustrating plants.

MYOSOTIS

The checklist of *Indigenous Vascular Plants of New Zealand* compiled by Tony Druce (updated and expanded by Shannel Courtney 10th revision, August 1999) contains 33 named and 25 so far unnamed species of this fascinating genus, making New Zealand without doubt its world headquarters. It would seem surprising then that these plants are not more conspicuous either in the field or in cultivation.

In *New Zealand Alpine Plants* Alan Mark wrote: '... several are local in occurrence and even the more widespread forget-me-nots are seldom prominent in the vegetation' (Mark and Adams 1995). This observation is reinforced by Brockie who wrote: 'The New Zealand species are more thinly dispersed (than their European counterparts) wherever they may occur. This may be on cold, wet, precipitous cliffs or on gravel beds in the upper reaches of some of the larger rivers; a few species grow on stony debris even on the crest of high mountain ranges and some appear only in association with other herbaceous plants at lower altitudes' (Brockie 1945). We believe these two quotations explain why, despite the large number of species that exist in New Zealand, forget-me-nots are seen only occasionally by those working in the field (Fig. 2).

Figure 2. *Myosotis concinna*.

For the serious grower there are two major problems inhibiting cultivation. Firstly, there is the problem of keeping these sometimes magnificent plants alive for any length of time. We have, of course, keenly felt from time to time the loss of one of our natives, but to lose such magnificent plants as *Myosotis macrantha* with flowers ranging through yellow, golden brown, and a wonderful iridescent green, is a sad loss indeed. Other species we have lost over the years, despite our not inconsiderable expertise, include *M. arnoldii* (red flowers), *M. capitata* (violet blue flowers), *M. oreophila*, *M. uniflora* and *M. pulvinaris*.

Secondly, there is the problem of the correct identification of the plant that one is growing. A first priority for any serious grower of special plants is that the name on the label attached to that plant be the correct name. We have found it very frustrating indeed that, even though the provenance of the *Myosotis* in question is beyond doubt, it can be identified as a completely different plant by the different experts consulted. We understand that a revision of the genus is soon to be undertaken by Dr Alastair Robertson of Massey University. This should clear up some major taxonomic problems.

Unfortunately the problem of the longevity of these plants in cultivation may not be so easily solved. Our experience has proved that the plants that flower best also die most quickly, stricken by the almost always fatal attack of a species of downy mildew specific to *Myosotis*. It would appear from observations by field workers that species such as *M. macrantha*, although appearing to be very robust, are much less so than they look and their life in the field may not be more than one or two seasons at most.

The difficulties inherent in growing these alpine species will probably deter most people from attempting their cultivation. However, should the attempt be made, choose the site very carefully. It should be rather bleak and cold, on the dark side of a large rock or tussock, moist, well drained but never under overhanging foliage.

There are however a number of lowland species and one plant that reaches the alpine zone that grow quite happily in our garden without too much time having to be expended on keeping them in good health. This is because we consider them to be annuals, and once established they will self-seed happily into the ground around them, or into adjacent pots or into gravel paths (if you have them).

These species are: *Myosotis pansa* (or *M. petiolata* var. *pansa*), *M. pottsiana* (or *M. petiolata* var. *pottsiana*), *M. forsterii*, *M. mathewsii* and *M. spathulata*. One true alpine species *M. australis* (yellow or white flowers) is very easy of cultivation but in our conditions it is also best regarded as an annual. It will seed freely around the garden and does not seem to lose vigour over time as do some of the afore-mentioned. *M. colensoi*, of very limited distribution in mid-Canterbury, is perhaps the very best species for cultivation, both for its beauty of form and its robust constitution.

Mention should be made here of *M. laeta* a species of very limited distribution, known only, and then but rarely, from the Red Hills flanking the Wairau Valley in Marlborough. Tony Druce (pers. comm.) records finding it 'growing in wet areas' and although we have not been able to reproduce the conditions in which it grows in the Red Hills, it has persisted in cultivation here for over five years, which, measured against the life span of other *Myosotis* species, makes it a very old plant indeed. Unfortunately it has never flowered in that time, but its almost complete resistance to attacks of mildew and fungus diseases make it a very valuable plant for long term study. The original plant has been divided with the result that several plants are now in cultivation both here and at Percy's Reserve.

Finally, two perennial species, both from our North Island mountains, *M. eximia* (Fig. 3) from the Ruahine Range and *M. saxosa* from the ranges of Hawke's Bay, seem able to largely resist mildew and, in the event of being burnt off by the summer sun, they seem to emerge in late autumn ready to bloom again in the spring.

Figure 3. *Myosotis eximia.*

As is well known both by those working in the field and by growers, alpine plants in particular are subject to considerable variation in production of flower and seed, apparently as a result of variable weather conditions in different years. Indeed it has been suggested that for some plants a period of five to seven years sometimes elapses between good years in the production of flower and seed.

Myosotis not only respond in this way to poor seasons but, to add to the frustrations of growers, they seem to flower with great luxuriance in new soil but appear to lose vigour after two or more seasons in one position. Also, in some years, disease in various forms seems to take a very heavy toll. Much more research needs to be done before these and other questions about these plants can be answered. We would be very pleased to hear from any members with experience in growing our native *Myosotis* who have encountered some of the problems met with in their cultivation.

WAHLENBERGIA

Growers of our native plants generally tend not to be greatly interested in the rather charming if sometimes weedy group of New Zealand harebells. Mostly easy to establish and maintain in cultivation, we have found them to be invaluable additions to our rock garden where they quickly naturalise and hybridise!

A number flower throughout the summer and on into late autumn. We have them growing in gravel, amongst stones and rocks, and through and amongst sedges and grasses. In fact there are not many areas in the garden, except in deepest shade, where they do not appear to flourish. They do, however, produce their finest displays where they receive a full quota of sunlight. As with most other native plants, adequate moisture and good drainage are helpful to their well-being.

Judith Petterson has completed a major revision of the genus and it will be seen in the following notes that there are name changes to some of the species (Petterson 1997).

We supply the following information about a number of species we are currently growing in the hope that more Botanical Society members will be encouraged to include them in collections of New Zealand plants. Firstly, three species growing in the Wellington botanical district make interesting additions to collections of local plants. All are easily grown and freely set seed.

W. violacea with its bright blue-violet flowers is 'often a garden weed' to quote a note by Judith, but it is easily controlled and it seems to colonise areas in which more sensitive plants struggle to survive.

W. ramosa with small, lilac flowers and *W. rupestris* with large, pure white flowers are plants rarely seen either in the field or in cultivation but these two, the former found on parts of the Wellington coast, the latter from the Pahaoa Gorge and Manawatu Gorge, make interesting additions to any collection of New Zealand plants.

Without doubt the next two species are the most favoured horticulturally, and with good reason. *W. akaroa* is found very sparingly on remote cliffs on Banks Peninsula. It produces a mass of large pale blue flowers over an incredibly long period, likes full sun, is very attractive to bees and is one of the easiest native plants to cultivate.

W. mathewsii is the next plant which is a favourite horticulturally and we could do no better than again quote Brockie: 'The Marlborough bluebell *W. mathewsii* has longer leafy stems with larger and pale-lilac flowers and its soft fleshy roots penetrate deeply in the crevices of limestone cliffs and rocks. It grows vigorously in cultivation if its roots are laid on a level surface of loose soil and a flat rock is used as a covering.' (Brockie 1945).

We have followed this method with success. Our *W. mathewsii* regularly flowers for at least four months of the season and produces large quantities of viable seed. Dolomite lime added annually to the soil increases its vigour.

We will conclude these notes on *Wahlenbergia* with mention of two species which we count amongst the most delightful in our New Zealand collection. Both can be grown in rock or alpine gardens and are equally fine specimens for pot culture.

W. congesta 'is found in nature only in hollows between sand dunes and on beaches and coastal rocks on the west coast of the South Island within reach of sea spray' (Petterson 1995) and in time forms a mat that creeps through fine gravel. It has relatively large white flowers on very short stems.

W. pygmaea 'is found in the North Island highlands from Lake Taupo and Lake Waikaremoana southwards above 915 m. Each mountain area has its own variety' (Petterson 1995). We grow two varieties of *W. pygmaea*, one from the volcanic plateau with pale, icy blue flowers, and one collected by Tony Druce from the Kaweka Range with large, deep blue flowers which tend to fade rather quickly. Both of these latter varieties of *W. pygmaea* are small but tough alpines with tidy rosettes of deep green leaves offset in season by their delightful flower display. They are easy of cultivation, requiring the usual elements—part shade, adequate moisture at all times and good drainage.

There are a number of other species some of which would be of interest only to a *Wahlenbergia* enthusiast, but *W. laxa* from northwest Nelson and Nelson Lakes National Park is extremely desirable if one is able to obtain it.

OURISIA

We are fortunate to have a small stream dissecting our property. No matter how long or dry the summer/autumn, the flow in this stream never dries up. Adjacent to the creek (as we call it), we have constructed a moraine garden, where the mixture of soil and gravel remains moist and cool but well-drained all year round. This moraine is sheltered from the prevailing northerly by a grove of native trees and a number of tree ferns growing on the stream bank. As the moraine is on the south facing side of the stream, the sun, even in mid-summer, does not reach there until well into the afternoon.

Here, we grow those plants which like more or less cool shade and a constant supply of water: *Ranunculus* species (including *R. lyallii*), small *Dracophyllum* species, *Gunnera* species, *Bulbinella* and *Ourisia* species.

The soil mix in the moraine has a gravel content of about 75-80% to ensure perfect drainage, but otherwise the ingredients of the 'Brockie' mix are retained, though in lesser amounts, particularly with regard to the clay.

While *Ourisia* flourish best in the environment just described, they will also grow in the rock garden or in the type of bed described in the general introduction, provided their primary requirements are met, i.e., adequate moisture, a cool location and more or less shade.

Ourisia, being spreading rhizomatous plants, need plenty of room to move about in the garden. Do not crowd them with other plants. Feed twice yearly with a moderate top dressing of bone flour. They also make excellent specimens in pots, but because of their tendency to spread, rather quickly exhaust their soil. Repotting should be done annually. Use the Brockie mix plus a handful of bone flour as the potting medium. A few potting mixes, particularly those composed of well composted bark, animal manure, pumice and slow-release fertiliser also give excellent results. A large pot is recommended.

Species grown by us and recommended are: *Ourisia macrophylla* ssp. *robusta* (North Island, Volcanic Plateau and adjacent mountains, not Mount Taranaki) (Fig. 4) and *O. colensoi* (North Island, from Coromandel to the Tararua Range). This latter species is particularly recommended as it is long-lived and very easy to cultivate.

Figure 4. *Ourisia macrophylla* ssp. *robusta*

O. lactea ssp. *drucei* (Mt Hikurangi to Ruahine and Tararua Ranges, also on Mt Taranaki (Egmont) and Pouakai Range in the North Island (Arroyo 1984)) is a particularly fine species which is free flowering in suitable conditions. Our plant from the Tararua Range flowers regularly.

A smaller ground cover species, *O. caespitosa* is also grown here, but this can be an exasperating plant, as it will die out in large patches for reasons that are obscure. It prefers fine, moist gravel in which to spread widely.

Much work remains to be carried out before this most desirable genus is able to be cultivated with anything but the most limited success. Many of the most beautiful species from the South Island must remain for us, at least in the meantime, on the 'impossible' list.

RANUNCULUS

In our experience, there are a number of native plants which, no matter how difficult they may be to cultivate, or how much mental resourcefulness needs to be spent upon the problems associated with keeping them alive, nevertheless remain high on the list of must haves for hopeful New Zealand plant enthusiasts.

The more spectacular *Celmisia* species, *Myosotidium hortensia*, *Leucogenes* spp., the cushion species of *Raoulia* and *Haastia*, the penwiper *Notothlaspi* var. and of course the so-called Mount Cook lily, *Ranunculus lyallii*, are all plants to quote Reginald Farrer when writing of the North Island edelweiss 'desperately to be desired' (Farrer 1938).

The plain fact is, though, without the amenity of an alpine house or an especially equipped glasshouse, most of these plants are better to be crossed off the 'I must have' list, and one's energies directed to equally desirable but more amenable plants.

Ranunculus lyallii, the world's largest and most spectacular buttercup certainly falls into the category of difficult. We have met many who were deeply disappointed with the negative results of sometimes many years' work trying to flower this magnificent plant in cultivation, or even to keep it alive more than one season.

We grow *R. lyallii* and have done so now for some years. One plant flowered for us in 1992. Nothing since. Our advice to Wellington growers is to forget it, but should anyone wish to attempt its cultivation, we would be happy to pass on our experiences with this intractable beauty.

On the other hand, for those wanting to grow some other species of the fine range of New Zealand buttercups, we can offer both hope and encouragement. *Ranunculus insignis* in its many forms is a particularly beautiful species and some of these forms which now include "*R. lobulatus*" and "*R. monroi*" are relatively easy to grow. A warning, however. At the end of summer through autumn even these species will, for no apparent reason, suddenly collapse and die. For the real enthusiast only!

The usual 'Brockie' mix, perhaps with the addition of extra leaf mould or other humus, is very helpful. Moisture is, of course, very important but good drainage, as with all our alpines, is essential. Mildew can be a problem during our warm summers but this can largely be overcome by planting the *Ranunculus* where they can get a rather deep, cool root run, and in a position where they receive adequate but not excessive summer sunlight.

Other species recommended as being not too difficult are: *R. berggrenii*, *R. enysii*, *R. gracilipes*, and *R. nivicola*. Some native species can become quite weedy and caution is advised when one is considering introducing some of the easily grown lowland species to one's rock or alpine garden.

We believe that those wishing to grow any alpine species of *Ranunculus* should reflect on the wild location of a number of the most desirable species. They grow from the low to high alpine zone and some have a liking for at least a trickle of icy glacier melt water, whereas many also grow in close proximity to substantial streams and waterfalls, and usually in a rocky bleak environment.

In our gardens we cannot hope to reproduce or even approximate many of these environmental factors. Therefore, we must question whether our energies should be directed towards plants much less exacting in their requirements. However, any Bot. Soc. members still wishing to attempt the cultivation of our choice alpine species of *Ranunculus* are more than welcome to consult us on the do's and don'ts in the cultivation of this fascinating but difficult genus.

GROUND COVERS, GRASSES AND GRASS-LIKE PLANTS

Our observations regarding the 'head in the sun, feet in shade' requirement of many of our trees and shrubs extends equally to the majority of our herbaceous and alpine plants. In compiling this series of notes, we have looked back over many years work with our herbaceous plants, well remembering our sense of utter frustration as yet another of our carefully nurtured treasures gave up the ghost, despite our best endeavours to save it.

However, over a period of about the last five to seven years our success rate has dramatically increased, and we are convinced that one of the keys to this greater success is an ever increasing knowledge, not only of the most appropriate treatment of these plants horticulturally, but also a deeper botanical knowledge of the plants we are attempting to grow. We fully support Brockie's conclusion: '... an illimitable scope for interesting research is open' (Brockie 1945).

It was shown, beyond doubt, early in our attempts to cultivate many of our alpine plants that they did not thrive in the completely open garden situation. *Celmisia*, *Myosotis*, *Ranunculus*, *Ourisia* and *Chionohebe* spp. amongst others, either failed to make reasonable growth after planting or rather quickly collapsed and died.

We learned by recalling how and where these plants existed in the wild that they rarely, if ever, grew as isolated specimens but nearly always appeared in

association with many other plants. Also, most grow under or close to sheltering tussocks or rocks and mostly the soil in which they grew could not be seen because of either a heavy turf of ground covers, deep scree or a mantle of broken rocky debris. Beneath these layers the plant roots penetrated deeply into cool moist soil. Perhaps then if we were to replicate as much as we could of these conditions in our garden situation a major problem would then be solved, and so it proved to be. Local quarries supplied our needs with various grades of rock rubble. We use a reasonably deep mixture ranging from fine road gravel to quite large and heavy rocks.

There are, in the New Zealand flora, a large number of plants which can be classified as true ground covers. Of these we have found perhaps four groups to be the most useful in providing close, permanent and more or less decorative ground cover. While recommending these plants both for their usefulness in providing cool soil conditions, and for their abundance of either flower or fruit, we warn that in conditions that suit them they can become rampant and invasive weeds.

Most useful overall are two species of *Pratia*. *P. angulata* is both an easily gown and very decorative ground cover happiest in damp conditions. It is quite invasive and if care is not exercised will readily invade lawn and vegetable garden. We keep a close watch on its wanderings and compost large quantities annually. It and its mainly off-shore island relative, *P. arenaria*, are quite indispensable for promoting cool root conditions for both *Ranunculus* and *Ourisia* species.

Pratia can be used together with various species of *Acaena* and *Leptinella* to grow a thick mat which will soften the rather harsh appearance of a stony mulch. This combination is recommended also for the root protection of whipcord hebes growing in a rock garden, where the roots of the hebe are not able to reach under a large rock or the shelter of a tussock. The rather devastating effects of full summer on these vulnerable hebes can be greatly alleviated by planting adjacent to them a combination of the above species.

It is advisable to make sure that the more aggressive species of both *Acaena* and *Leptinella* are avoided as some can become persistent weeds. We recommend *L. albida*, *L. calcarea*, *L. minor*, *L. pusilla* and *L. serrulata* as ideal, together with *Acaena buchananii*, *A. inermis*, *A. microphylla* (Fig. 5) and *A. caesiiglauca* as being either singly or, more effectively, in combination as suitable ground covers for many difficult plants.

Raoulia falls naturally into two groups; the cushion species and the mat forming species. The former lie outside the scope of this article as they are specialised plants requiring very exacting conditions to be met before any success can be achieved in their cultivation.

The mat raoulias however are of easy culture provided they are planted in good light, the soil is well drained, with plenty of gravel in the growing medium

Figure 5. *Acaena microphylla*.

and they are not overgrown by adjacent plants. The mat raoulias are unequalled for covering extensive areas of an otherwise largely bare scree bed. Of the many and varied species, all of them worthy of cultivation, the following, for the reasons set out, have most appealed to us: *R. hookeri* var.—the plant found on Wellington's south coast and sold in garden centres as *R.* "Makara" is one of our best silver foliage plants for a scree garden; *R tenuicaulis*—wide spreading silver green mats, rather rampant so keep it away from smaller plants; *R. haastii*—a species which Cockayne considered 'less easy to cultivate' (Cockayne 1923) but with which we have not had great problems. It grows on river-beds in the Canterbury high country, and is unusual in that its summer colour is bright green and in winter it is a deep brown.

There are many more we have grown which we would also recommend, amongst them *R. australis*, *R. monroi*, and *R. parkii*. Some of the very desirable alpine species, *R. grandiflora*, *R. youngii*, *R. subsericea*, and *R. hectorii* are definitely less easy to cultivate but not impossible given scree conditions and experience gained over a period learning how to cope with these more or less difficult but choice plants.

We make brief mention here of another valuable group of plants which can be classed as groundcovers. In damp ground, beside a stream or pool various species of *Gunnera* can be easily grown, but they will also be quite happy in rock or alpine gardens provided there is adequate moisture at all times. These plants are grown for both their interesting foliage and conspicuous fruit. This is particularly true of *G. prorepens* which, in autumn and winter, produces long stems crowded with bright red drupes. Other species worth growing are *G. hamiltonii,* a threatened species which is not at all difficult, together with the smaller but interesting *G. dentata* and *G. monoica*.

To conclude this section, mention must be made of those large groups of invaluable plants both in the wild and in cultivation: grasses, sedges, rushes and allied plants. A garden of New Zealand plants without at least some *Chionochloa*, *Carex* or *Uncinia* species seems strangely incomplete and unsatisfying. Their ease of cultivation is an added bonus. We believe Wellington with its nearly ever-present breezes is the locality where these plants can be seen at their best. Some incredible patterns of light and shade, enhanced by their many, varied colours, can be achieved by thoughtful placing of them in practically every garden situation. Added advantages are their mainly tidy appearance and the shelter they afford more vulnerable plants. Also, the many species we grow here entice seed-eating birds into our garden.

SOME TREES AND SHRUBS

Many of the visitors to our garden are unfortunately only too quick to ask about and comment on the number of exotic trees and shrubs that we grow here. Even though some of these plants are not common in New Zealand gardens, visitors seem to know them much better than they do the large number of native trees and shrubs that we grow.

Of the natives, hebes are probably the best known. This is undoubtedly because a number of fine hybrids, bred by Jack Hobbs, have been featured quite prominently on certain garden programmes.

Visitors, however, are always struck by the number, variety and beauty of form and flower, or by the seemingly endless number, of species and natural hybrids of hebes growing on this property (Fig. 6). In both the range of size and form they definitely confuse those not familiar with their seemingly infinite variety. Here grow the smallest whipcords, *H. cheesemanii*, *H. tumida* and *H. tetrasticha* close to or alongside the large *H. barkeri* from the Chatham Islands, a large old specimen of the local *H. parviflora* and a tall "*H. egmontiana*'. Between these extremes are a bewildering number of species of all sizes and forms growing on our steep clay banks, out of bare ribs of 'rotten rock' in scree beds, rock garden, or in cultivated borders. In general, hebe species and their numerous offspring thrive in just about every situation here. Apart from occasional problems with some whipcord and a few of the *Heliohebe* groups, they seem to thrive! Their indifference to gales, rain or cold and long dry periods make them invaluable plants for most Wellington conditions.

Mildew and leaf-roller caterpillars attack some species, mainly the large leaved varieties. Most of the species that grow naturally in the northern areas of the North Island e.g., *H. adamsii*, *H. perbella*, *H. macrocarpa*, and *H.* "Whangarei" flower for us from mid-winter to early spring, and they unfortunately appear to suffer most from attacks of mildew. The *Heliohebe* group is also very susceptible to this disease. We have never been able to grow an unblemished specimen of *H. lavaudiana*, a particularly desirable species from Banks Peninsula.

Figure 6. *Hebe traversii*.

The whipcord group of hebes, together with *Parahebe* and *Chionohebe* species, are best regarded as alpines in the horticultural meaning of the word and grown according to the methods recommended for such plants elsewhere in these notes.

The great majority of the plants grown here require at least some adequate shelter from the prevailing wind, particularly during the period of the equinoctial gales. Early in the evolution of this garden much thought was given to planting trees which would be able both to resist the ravages of the salt laden northerly and to provide flowers and fruit to eventually attract birds to this bare place.

After trying out and rejecting several hardy exotics recommended by well meaning but ill-informed garden centre employees we finally chose (quite wisely, if rather fortuitously) the following New Zealand species: on the north-western boundary—*Pittosporum ralphii* in the wind tunnel of the stream bed and *Corokia cotoneaster* hybrids for the remainder of that boundary; on the north boundary—a selection of tough *Olearia* species: *O. angulata, O. albida* and *O. paniculata*; and on the south and east boundaries—*Olearia traversii*. This is now degenerate and is soon to be replaced by a local variety of *Hebe parviflora*, cuttings taken from plants growing on the walls of the Ngauranga Gorge.

A number of strategically placed large exotics, although not entirely keeping the wind out, at least deflect it sufficiently to enable more vulnerable and understorey species to grow and flourish. Within this living protective cover, and under it, can be found *Coprosma* species including a fine specimen of *C. waima* growing on the edge of a steep clay bank and a very healthy *C. serrulata* growing close to the drainage channel of the moraine garden.

Visitors often remark on what to them is the rather exotic or, in their terms, 'tropical' character of parts of the garden (at certain times of the year how fervently we wish this was the case!). This so called exotic appearance is the result of the relatively large number of ferns, *Cordyline* and *Dracophyllum* species growing in such a small area.

The vigorous growth of various species of climbers and lianes seems to suggest that there was once on these exposed hills, a dense forest cover in which plants of *Clematis, Parsonsia, Metrosideros, Muehlenbeckia, Fuchsia* and *Ripogonum scandens* must have thrived. A fine specimen of *Clematis paniculata* has been planted in deep shade close to the outlet of our small stream. It has climbed through adjacent tall trees to open its masses of magnificent blooms in the sun. It does however pay a price for this display; the flowers being at their best during the period of the spring equinoctial gales. The life of the flowers is consequently much shorter than those growing in more sheltered areas.

A particularly tenacious and robust climber is *Parsonsia heterophylla* whose cream-coloured, honey-scented flowers are much more wind resistant and, therefore, longer lasting. They also seem to attract large numbers of bees and hoverflies.

It will now be apparent that within this small and rugged area we grow an amazing variety of native plants. It will also be appreciated that a full list of these plants cannot be catalogued in notes such as these. We have been able to achieve what we have by not only providing shelter that has largely negated the effects of the prevailing wind but also by creating a series of microclimates in which to cultivate specific plants.

Observations over a long period have confirmed to us that many, if not most, of our New Zealand native plants favour a 'feet in shade, head in sun' situation. For trees and shrubs, this ideal environment can be achieved with careful selection of sites which, with some landscaping work, can be made to simulate a bush area where such conditions naturally occur. For herbaceous plants these conditions can be created by the use of material ranging from good sized rocks carefully placed, to extensive use of tussock-like grasses and sedges. Suitable ground cover plants also help to create the ideal 'feet-shade, head-sun' environment.

CONCLUSION

Nearly 75 years ago Leonard Cockayne wrote: 'Certainly the appreciation of the plants in question has increased greatly of late years but this appreciation has been a matter of slow growth. And perhaps this is all the better if their coming into horticulture is to be permanent and not mere fashion' (Cockayne 1923).

He had no need to worry on that score. Fashion, unfortunately, plays (as it does in many facets of life today) an inordinate part in determining what we

shall and shall not grow in our gardens this coming season. This fact, together with a certain cultural cringe mentality reinforced by media and television gardening sessions extolling the virtues of the latest overseas weed and the absolute necessity of adding it to our already grossly overstocked collection of fashionable and undesirable exotics, leads one to agree inevitably with Cockayne that: 'In fact, it is correct to say that, to a vast majority of amateur gardeners, the native plants are unknown' (Cockayne 1923). His observation that many of our plants are highly prized overseas remains just as true, if not more so, today. In fact, a number of our very rare and special alpine plants, for instance, are as prized in overseas horticultural circles as are several species of our fauna to overseas collectors of such.

The era of political correctness has seen an upsurge, albeit a faint one, and for all the wrong reasons in the gardener's use of New Zealand plants. Visitors to our garden often state that they come and see how to grow native plants as they feel they should have at least a few in their own collections. Most seem unaware that in our Wellington environment, especially in those areas most adversely affected by severe weather a number of our underrated and neglected native trees and shrubs are the only plants that will withstand such conditions, and enable gardeners to establish within their shelter more vulnerable species both native and exotic. Perhaps we should close this preamble with the words again of Leonard Cockayne, because we feel that he sums up best the philosophy of our small, suburban, native garden.

'Thus our gardens should surely possess a peculiar stamp of their own, and a national horticulture come into being with not only a rich exotic garden flora, but one where New Zealand plants themselves would play no inconsiderable part ... in our gardens of all the trees or shrubs, or herbs which we cherish none can ever rank quite as high as those which slowly took their shape on New Zealand soil in the far distant past' (Cockayne 1923).

It would probably be true to sum up the attitude of the majority of Botanical Society members to the cultivation of our New Zealand plants is that as long as the plants being cultivated are procured legitimately then such cultivation is to be encouraged, as a great deal can be learnt about these plants from close and constant observation of them, as Cockayne observed: 'At one time those desirous of growing New Zealand plants had to procure them from their wild habitats. There is no longer any need to do this' (Cockayne 1923). This observation is more relevant today than it was even in Cockayne's day.

Nearly all plants from trees to alpine ground covers, both plentiful in the wild or rare and local can be obtained from legitimate growers and suppliers who have the necessary permits and the wide field knowledge to gather and grow from seed most of those native plants that would satisfy most gardeners, apart from the grower wishing to specialise in scree plants or other particularly difficult members of the flora. We have published in the Bot. Soc. Newsletter (August

1996) a list of such suppliers, and it is our intention to add to, and revise, this list from time to time.

Much ground remains to be covered in the important matters of propagation, specific growing environments for individual plants and the best possible care for particular plants in cultivation. Should members show sufficient interest in this whole subject we would be very willing to do a follow up to the present necessarily sketchy preliminary article. It is our aim to continue to give practical expression to those two very important objectives of the Wellington Botanical Society to which we drew attention in our Introduction.

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Our sincere thanks go to those Bot. Soc. members who, since our introduction to the Society some ten years ago, have encouraged us in our endeavours.

Olaf John, first and foremost, has been our mentor. He opened many doors for us. His generosity and enthusiasm have never waned and his advocacy of the study of New Zealand plants in cultivation has been an inspiration.

Our first acquaintance with the late Tony Druce was in 1990 when, with no small trepidation, we had invited Tony and Helen to visit our garden to assist us with identification of plants which, in our state of ignorance at that time, we were quite unable to name correctly. Expecting to be roundly criticised for our temerity for both growing and naming these plants without any professional training in either horticulture or botany we were more than taken aback by the enthusiastic and generous endorsement of our efforts by them both. Tony's incomparable knowledge of New Zealand's plants was unhesitatingly shared with us whenever we needed assistance, while the supply of plant material, published botanical work and, not to mention, moral support from both him and Helen has been vital to what success we have achieved in our endeavours.

There are, in fact, so many who have helped us that it would seem invidious to mention some and not others who have assisted us with either plant material or advice of some kind or other, but we do feel that we owe a special debt to the following: Tony Silbery, who gave generously of his time, knowledge and plant material; Pat Enright, for sharing his extensive knowledge of New Zealand plants, and for opening so many doors for us; Copper and Keith Hay of Evergreen Nurseries, Tauranga, for their enthusiasm, and as a source of authentic plant material; Steve Newall of Dunedin for most generous contributions of viable seed; Phil Garnock-Jones and Barry Sneddon of Victoria University of Wellington for donations of both plant material and botanical knowledge; and to those generous members of Wellington Bot. Soc. who helped with garden maintenance during recent periods of ill health.

Lastly, we acknowledge the debt we owe to those two wonderful Wellington institutions, Otari Native Botanic Garden, and Percy's Scenic Reserve, and their respective managers, Anita Benbrook and Robyn Smith.

We believe and hope our association with all those mentioned has been mutually beneficial and will, in time, lead to the establishment of a network including many people interested in growing a greater range of our unique flora and in widely disseminating the knowledge gained from such enterprises.

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