New Zealand Garden Journal

Journal of the Royal New Zealand Institute of Horticulture (Inc)

Echeveria gibbiflora

A Plantsman's Notebook • An Illustrated Guide to Hebe
Exotic trees in Wakehurst's Woods • Pulmonaria - an alternative to Hosta
Southern Alpines - an International Conference • Towards a Better Town Belt

Volume one, number three, September 1996

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NEW ZEALAND GARDEN JOURNAL

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Plant and Garden News

Herb Federation plant collections

The Herb Federation of New Zealand, has for several years operated a national collection scheme for herbaceous plants. Collections are mainly generic but include those for specific uses such as dye and medicinal plants. Collection holders have to maintain certain standards to be registered as national collection holders and must keep comprehensive records. The scheme currently contains 16 collections comprising Allium Artemisia (2), Dye plants, Lavandula (2), Monarda, NZ Medicinal plants, Plantago, Plectranthus, Rosmarinus, Teucrium, Thymus, Salvia (2), Violet. The reason for having more than one collection is to provide a wider range of climates for different species and to encourage sharing between collection holders.

The collections are used for taxonomic and research purposes and play an important conservation role, especially with garden cultivars.

The Herb Federation welcomes new collectors and those interested should contact Bunny Rathbone, Convenor, Plant Collections Committee, 107 Glenelg Street, Bradford, Dunedin.

Camellia blight

Camellia petal blight is caused by the fungus *Ciborinia camelliae*, and has a devastating effect on camellia flowers causing premature drop and subsequent poor flowering. The disease was discovered in Wellington, and is currently still found there although recent reports confirm it has reached Waikanae and Wanganui.

The fungus survives during the non flowering season as sclerotia in the top layer of soil under camellia bushes. Apothecia are produced in early spring (end of August in Wellington this year) and release spores that land on the opening flowers.

The Camellia Garden in the Wellington Botanic Garden was one of the first gardens to become infected. The changes in the garden have been monitored over the past three years and several measures to reduce its severity were tried. These included a thick mulch of pine bark, keeping ground under bushes clear of vegetation and pruning to increase air movement. Removal of fallen flowers was not considered practical in such a large area. In spite of this work observations this season showed that onset of infection in the last two weeks in August literally removed over 30% of the flowers. Without some form of effective control, continuing to grow spring flowering camellias in the Garden will need to be reviewed.

Aware of the problem, the Camellia Memorial Trust has commissioned HortResearch to carry out a two year programme to develop cultural and management practices for control and eradication of Camellia petal blight. They will be looking at prevention of sclerotia germination, and the effects of foliar and soil applied fungicides.

For more information please contact Karen Cooper, HortResearch, Private Bag 1401, Havelock North.

Medal awarded to New Zealand Plant breeder

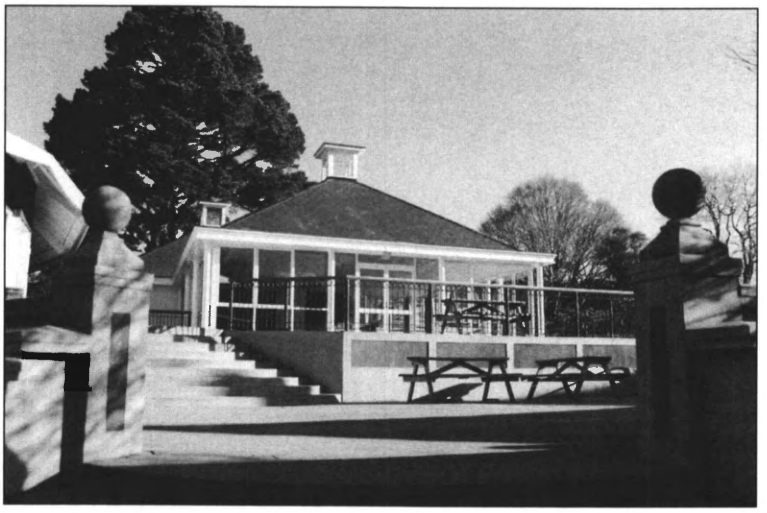
Dr. Keith Hammett AHRIH, has been awarded the most prestigious medal of the National Sweet Pea Society of the United Kingdom, the Henry Eckford Gold Memorial Medal. This medal commemorates Henry Eckford, who is considered the father of the modern sweet pea, and has only been awarded 17 times in the last 50 years. The award is made for achievements in hybridising, for literary or research work, for investigation of diseases or pests, or for any form of meritorious work helpful to the development and popularity of the sweet pea or the national sweet pea society.

The citation accompanying the award mentions Keith's profoundly deep knowledge about sweet peas and his willingness to share his knowledge with other people. It says 'In particular, the crossing of the sweet pea with the Belin pea, *Lathyrus belinensis*, is an achievement of momentous proportions and the culmination of many years of painstaking work. Most of you will be as yet unaware of the significance of all this for the future of our flower. I predict that the millennium will see not just the yellow sweet pea but other exciting colours, such as a real blue, resulting from the mixing of genes that this cross has produced'.

Keith has won many awards, indicating his standing both nationally and internationally as a plant breeder and floricultural scientist, but this award brings him special pleasure because his interest in sweet peas goes back to his childhood.

Garden News

Plant and Garden News



Dunedin Botanic Garden Visitor Information Centre

While visiting a botanic garden is generally an outdoor activity, the need to provide a central area for people to plan their visit has long been recognised. An Information Centre is an ideal means to provide guidance and interpretative material for visitors to the garden. Such a Centre can act as the starting point for new visitors, it can also aid communication between the public and the staff working with the main plant collections that make up a botanic garden.

The need for such a service was recognised several years ago, however, funding such a venture was not a reality from the Botanic Garden budget. Only through the sterling fund raising efforts of the Friends of the Dunedin Botanic Garden was it possible to build this valuable asset.

A Friends committee convened by Eric Dunlop, a past president of the Friends, has brought in many different contributions including grants, cash donations, products, professional services, and voluntary time. A substantial grant from the New Zealand Lottery Board covered nearly a third of the cost. Generous grants from the Alexander McMillan Trust, NZ Tourism Board, J & L Callis Trust, and N Milnes Charitable Trust have also been received, Duffil Watts & King, the consulting engineers and Millar Studios, the interior designers, donated some of their professional services. The project committee also organised several fund raising events including plant sales, lectures, a fun run and art auction.

The Information Centre is located in one of the busiest areas of the garden between the Tea Kiosk and the Winter Garden. Management of the Centre will involve the cooperative effort of Botanic Garden staff and the Friends of the Dunedin Botanic Garden. Interpretive Displays will be coordinated by a recently appointed Information Officer with themes including garden history, plant collections and seasonal highlights, to provide interest throughout the year. A shop, specialising in horticultural books will be operated by the Friends and staffed mainly by volunteers. Other merchandise available will be garden related products such as seeds, plants, cards, stationary, arts and crafts. Lady Reeves officially opened the Visitor Information Centre on 21st September.

Alice Lloyd-Fitt Information Officer

Applying organic wastes to soil

Recent research has shown that high rates of organic amendments can increase crop yields. The work at Levin Crop and Food Research looked at the yields of vegetable crops with two rates of organic amendments (green waste compost and chicken manure). At very high rates, significant yields were found but at lower more economic rates little difference was recorded. Soil scientist Mike Spiers said he would expect the structure of the soil would benefit in the long term with the organic addition and microbial activity would increase. Growers would have to compare the costs of adding amendments with the increase in crop yields to get a true indication of the benefits.

Contact: Mike Spiers, Crop and Food Research, Private Bag 4005, Levin.

Plant and Garden News

Major funding for urban parks in the U.K.

The National Lottery, established recently in the UK has been very successful in raising money for charitable purposes. The Heritage Lottery Fund, established to distribute some of these funds has announced that the revitalisation of the national legacy of public parks and gardens is to be a priority area for grants.

The Urban Parks Programme aims to spend up to 50 million pounds over the next three years on the restoration of all types and sizes of historic public open space. This will range from massive projects such as Crystal Palace, as well as Victorian Parks, seaside promenades and cemeteries.

The emphasis will be on restoration, repair and recreation of historic features but projects that include the provision of modern additions will also be considered. All applications will have to be accompanied by a comprehensive restoration plan.

Internet close to home

For those wishing to have up to date information on the New Zealand horticultural industry, you can now subscribe to HortNet, produced by HortResearch. This database of current and historical horticultural information contains nine major centres of interest :

- News
- Research news
- Industry contacts
- Events calendars
- Email
- Weather
- Library including access to HortResearch library card catalogues
- Statistics
- Services, including consultants columns and classified advertising

The annual subscription charge is $250 plus GST. For more information please contact HortNet, Private Bag 92169, Mt. Albert, Auckland.

More on the Internet

Raino Lampinen of Helsinki University has spent the last three years establishing what some have called the "Mother of all web sites in Botany". In mid March 1996 it had over 1800 links divided into 18 files alphabetically. These include :

- arboreta and botanical gardens (sorted by country)
- conservation and threatened plants (sorted geographically)
- checklists and floras
- gardening

The home page is http://meena.cc.uregina.ca/~liushus/bio/idb.html.

Global Horticultural Database

The Royal Horticultural Society in England is studying the feasibility of producing an international horticultural database. This will be based on the Plant Finder, a book published annually by the RHS and currently containing information on over 65000 plants and where they can be found. Chris Philip, co-compiler of the Plant Finder is collecting lists of plant finders from other countries and hopes to make the information available world wide via the Internet or as part of a CD-ROM of horticultural information.

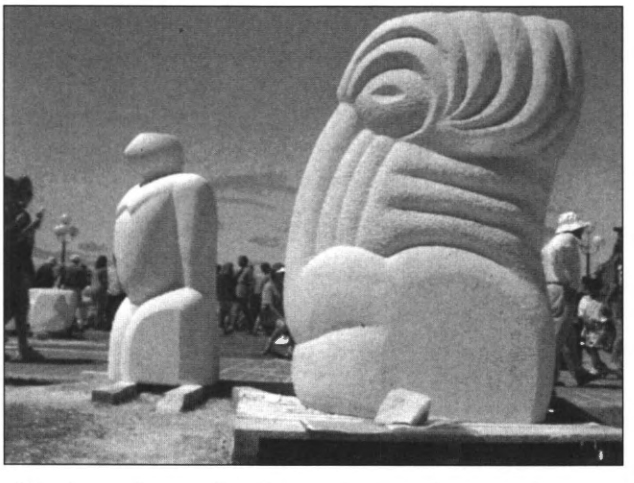
Streblorrhiza speciosa - another extinction?

Streblorrhiza speciosa or Philip Island Glory Pea was endemic to Philip Island, a small island adjacent to Norfolk Island. Goats and rabbits introduced to the island early last century resulted in the complete destruction of the island's vegetation cover, and with it, this unique plant. The animals have long since been removed and despite vegetation returning there is no sign of the Glory Pea.

The plant was collected, however, and it was known to be growing in Europe about 150 years ago. It was illustrated in Edward's Botanical Register in 1841 under the name *Clianthus carneus*. There is a dried specimen in the Kew herbarium, which was grown in Vienna.

Does anyone have it growing in their collection? It is a climber with pinnate leaves and pink flowers. If you do please contact Peter Green of the Royal Botanic Gardens Kew.

Tareitanga Sculpture Symposium - Frank Kitts Park, Wellington 4-18 February 1997



Here's a chance for those of you who are planning to redesign your garden to incorporate some original contemporary New Zealand sculpture. The second Tareitanga sculpture

symposium will attract over 40 sculptors from around New Zealand. They will spend two weeks working on 2 tonne blocks of Oamaru stone and creating a range of pieces that are expected to sell for between $500 and $7000.

There are still some pieces left from the 1995 event if you want a piece of sculpture now. For further information please contact Dennis Berdinner, 154 Breaker Bay Road, Seatoun, Wellington.

Root rots challenged?

For many years I have wondered how adding compost to the soil could help to control plant root and collar rots. Certainly the organic matter would help to improve soil structure. However, I've always felt there's a risk the compost could increase the incidence of soil borne diseases by helping retain soil moisture - maybe too much moisture in some instances.

One of the seminars at the Mystery Creek Fieldays was on controlling some of the common plant fungal diseases without using chemicals. At this seminar I found out how compost could be beneficial.

For root and collar rots to infect plants there must be certain conditions present. There must be a susceptible host plant, an active pathogen (that is a disease causing organism) and environmental conditions that favour the pathogen rather than the plant tissues. Some examples of the conditions are :

- Poorly aerated soils or potting mixes (e.g. wet soils kill root hairs, allowing entry of fungal threads into the roots)
- High soluble salt levels, usually from too much fertiliser
- Cut or broken roots (e.g. roots damaged during transplanting or cultivation operations)

The pathogen can only enter roots through dead or damaged areas.

Well drained soil or potting media, growing resistant plants, disinfection before planting, and the use of chemicals around roots are techniques used to get good plant growth. Methyl Bromide (soon to be banned because of ozone damage) and steam are common disinfection methods. Chemicals such as Terrazole and Alliette are added to plant root zones at or before planting. There is always a risk the harmful organisms will build up resistance to the chemicals we apply to plants and soils.

However, biological controls are being used successfully. This control is based around strains of the Trichoderma fungus (you may already have heard of this for the control of silver leaf on roses and fruit trees). The Trichoderma fungus is introduced into the plant root zone. Its presence protects plants from infection by organisms such as Phytophthora and Armillaria. Trichoderma can also control infections already established in plants.

So what's this got to do with the compost mentioned at the start? Strains of Trichoderma have been isolated from compost. Adding compost to a soil where root rots are a problem introduces Trichoderma fungus to that soil. Trials in N.Z. have shown that adding compost around infected plants can lead to recovery of those plants.

Inspection of the plants some time after compost application shows vigorous new roots developing in the compost and surface soil. These new roots are protected from root rot fungi by the presence of Trichoderma fungus.

Don Estcourt RNZIH Wellington Branch Newsletter

Paying for public parks

In Europe most botanic gardens make some sort of charge for entry and in many cases these charges are quite substantial (Kew is about $12). Many other gardens are looking to introduce charges. If this is not possible, they are looking at other ways of raising money. For instance Edinburgh Botanic Garden cannot charge because of its Act of Parliament but asks for a one pound donation in its glasshouses. People have to pass a staffed desk to get in. As a result, in 1994 about $140,000 was raised by donation!!

It is not perhaps surprising that the spectre of paying to enter parks in New Zealand was recently debated in Auckland. The Parks committee of the Auckland Regional Council debated the introduction of an entry charge for vehicles entering their parks. The motion was lost but the ongoing cost of parks and the need to increase revenue will ensure the principle of free entry to parks will continue to be debated around the country.

Work wanted

Andrew Hatfield, a horticultural lecturer from the United Kingdom is planning to move to New Zealand and is looking for employment in the horticultural field. Andrew has a Master of Horticulture (RHS) and has a good practical background in landscape construction. If you can help please write to Andrew, 22 Brooklands, Nunsfield Rd, Buxton, Derbyshire, SK17 7BQ, U.K.

Plant and Garden News

Gardening Advice

This will be the start of a regular column where readers can write in asking for advice on horticultural matters. Whenever possible we will consult with experts in the field. We thank Joan Swinbourn of Tauranga for the idea and for the first two questions.

Clivia nobilis

Is it common to have almost continual flowering in *Clivia nobilis*? A sizeable clump, almost fifteen years old, in my garden has had at least one flowering head continually throughout the past year or more. It is planted at the base of *Fuchsia arborescens* and further shaded by a *Pittosporum tenuifolium*, thereby being in light shade with no direct sun. It has always been erratic in flowering but has now excelled itself.

Clivias are from South Africa, and in their natural habitat are mainly winter flowering although Clivia nobilis can flower through spring often until December. In cultivation they generally flower in the winter although flowering can fluctuate widely. The plants in question seem to be growing in ideal conditions in shade, and are probably quite root bound because of their age. This often tends to produce better flowering in Clivia miniata, so it is quite likely that it has the same effect on C.nobilis. The warm summer may also have helped to prolong flowering past its normal season.

Poisonous mulch?

A neighbour this summer used eucalyptus sawdust on his vegetable garden with disastrous results of stunted growth and scarcely any crops.

A nursery bed of Acer and other deciduous trees had a high mortality rate after Eucalyptus chips were used as a mulch. Pine species were not affected. The chips came from a freshly felled tree and had not been weathered before use.

This is a difficult question to answer without proper investigation. However the following points may help. Use of any fresh sawdust on vegetables is likely to cause problems because the micro-organisms that break down the sawdust use nitrogen from the soil. This can cause nitrogen deficiency in the soil. This is particularly a problem with quick growing plants like vegetables that have a high nitrogen requirement.

The use of chips on perennial crops will also cause nitrogen deficiency but because the chips break down more slowly than the sawdust, it is rarely a major problem, and would not have caused the trouble with the bed of acers. It could be a range of factors, for instance there may have been some toxins in the bark because it hadn't been weathered, although a search of Australian gardening books does not mention eucalypt bark as a problem. If the chips had been put on too thickly during a wet winter they could have caused problems with waterlogged soil, or if placed too near the trunk could have created conditions suitable for pathogenic fungi to thrive.

Does anyone else have any ideas?

A Plantsman's Notebook

by Derrick Rooney

Make no mistake about it: peonies are magnificent flowers. But they are not good garden plants.

They take up lots of space, and flower for only a few weeks. They tolerate partial shade, but do best when they have full sun. They cannot abide overcrowding. If there is not plenty of space around them, and plenty of fresh air circulating in it, peonies are apt to come down with fungal diseases , including mildew and (worst of all) a pernicious form of botrytis that can cause whole stems, and even whole plants to collapse. Peonies like rich soil with plenty of lime, which does not suit some other plants, such as rhododendrons and camellias, that might otherwise make good companions for them. Their flowering period is brief; barely a fortnight in some cases.

For all that, the thought of a garden without herbaceous plants is like, well, like corn chips without chilli, or chalk without cheese. In all three cases, you have to know how to handle the ingredients to get the tastiest results. Peonies should be treated like cauliflowers. Plant them in the vegetable gardens, feed them up, and they will produce strong, long stems bearing massive flowers for picking. But be patient with them; don't expect much of a floristic display for at least two years after planting, and be prepared to wait three.

Peonies are long lived. Unlike most herbaceous perennials, which in their wild state are essentially colonisers or opportunists continually in search of fresh soil, peonies will happily settle down in one spot for 20 years or more. If well maintained, they will continue to thrive for much longer. I know of one garden with huge healthy old peonies planted by the incumbent's grandmother.

It's not necessary to let them go on as long as that, and although they resent untimely disturbance it is possible to divide and transplant them without loss. The mistake that many gardeners make is to treat peonies like other summer-flowering perennials, and divide them in winter, while they are dormant, or in spring when the growth buds are flushing. If you do this, you risk losing them.

Peonies, like some other perennials such as irises, divide their life cycles into discrete periods in which either the roots or the shoots are growing. Peony roots consist of heavy, tuber-like structures that double as storehouse for nutrients, and annual feeding roots which replenish the tubers. The feeding roots begin to grow in spring well before any shoots emerge, so that by the time flowering makes heavy demands on the plant's resources, the peony has a solid foundation from which it is drawing fresh nutrients. If this root cycle is disturbed, the shoot growth outstrips root growth, and the plant is stressed. Buds will abort, and stems may collapse. The plant may take years to recover and resume its normal flowering pattern. The safe time to divide herbaceous peonies is in early autumn, after the leaves have changed colour but before they have died off.

Carefully dig around the plant and lever them out of the ground with minimum damage to the fleshy roots. Gently hose the soil off them. If the weather is damp, you can safely leave peony clumps sitting on top of the soil for a few days. If it is dry, toss a sack over them. This will allow the fleshy brittle roots to shrivel and soften a little and reduce the damage when you cut them up.

Do not try to lever peony clumps apart with back-to-back forks, as you would with, say Michaelmas daisies, and do not chop them up with a spade. Get a sharp knife, or a small saw if the plants are old and woody, and cut them tidily into pieces which have a good clutch of tuberous roots and at east three (preferably five) 'eyes' (growth buds).

If you had the forethought to prepare a site for them, and can replant them immediately, so much the better. Flowering may well continue without interruption in the following summer, although the flowers will probably be smaller than usual. If you don't have a site ready immediately, don't worry. The roots can be plunged in damp sawdust or peat and stored in a shady place for several weeks. But they must be replanted before winter.

Herbaceous peonies are a mixed bag of Asian, Eurasian, and European species. The shrubby types of peony are of Asiatic origin and are known for inscrutable reasons as tree peonies. With the exception of the yellow *P. lutea* var. *ludlowii* and the red *P. delavayi*, which are easily raised from seed, they are rare, expensive, and slow to establish. Most of the available plants are imported.

The finest tree peonies are the hybrids of the Chinese *P. suffruticosa*, a sumptuous but temperamental plant with the largest flowers in the genus. They need perfect drainage, both

above and below ground, plenty of nourishment, and irrigation in summer. Their defect, in our unreliable weather, is that they are adapted to a continental climate and have little resistance to unseasonal cold snaps.

Tree peonies also tend, in Canterbury, to break into growth too early in spring. I have had tree peonies cut to the ground by September snow. There is alas, no solution to this problem, but its effects can be minimised by siting the plants in the coldest parts of the garden, where they may be discouraged from bursting into premature growth. Some of the later-flowering cultivars regularly escape damage, but it is the spectacular early flowers that most vividly reward the risk-taking gardener.

Siberian irises blend happily with peonies, but bearded irises don't make good companions. They have too much in common with peonies: brief flowering, fussiness about when they ought to be moved, hunger for sunlight. A good garden ought to have room for both, though, like peonies, individual bearded irises have a short flowering season (few last longer than a week or two). Unlike peonies, they occupy little space, and you can cram a large number onto a border. By careful selection, you can contrive to have colour in most years from September almost to December, starting with stems less than 20cm tall and ending up at a metre or more.

The 'dwarf' and miniature varieties flower first. The smallest, such as the original forms of *Iris suavolens* and *I.aphylla*, will be submerged in a border, and are best grown in a rock garden or trough. Tougher customers like 'Blue Bonnet' and 'Coerulea' are more adaptable, but they too, need protection against overcrowding by their taller relatives.

Some of the so-called miniature dwarf bearded irises flower in September, before spring is properly underway. The flowering cycle progresses, by and large, in order of size, and thus the intermediates appear next in mid to late October. Both these groups are excellent garden plants, better in many ways, than their popular, tall cousins, despite the fact that the tall bearded irises have a broader and brighter range of colours. The trouble with tall bearded irises is that they flower in November, at the height of the nor'west season, and more often than not the top-heavy spikes are badly knocked about.

You can prevent this by staking each spike individually, but this is too formal, too fiddly, and too unsightly for my liking. I like a more relaxed garden where it doesn't matter if you don't pull out every weed. If the edges of the lawns aren't trimmed, so what? There's more to life than tidiness.

Tall bearded irises are plants that like to be neat, however, so the best place to grow them is in rows in the vegetable garden, between the carrots and cabbage, or the garlic and the lettuces. You can grow your peonies there too. It's not a bad idea, for that matter, to dump in your vegetable garden all the flowers that you want to grow for cutting.

Like peony propagation, iris propagation is all timing. It is a source of mystery and confusion to many people, but there is no need to be confused. Like peonies, irises have a two-phase growth cycle, alternating between roots and shoots. To propagate them successfully, you must home in on the window between the phases.

Nearly all irises have this window, which makes it possible for them to be wrenched out of the ground, pulled to pieces, and replanted without suffering permanent ill effects. For bearded irises, the window comes about 3 weeks after flowering. They have just completed the first phase of their growth cycle, and the old roots are beginning to shrivel. Soon, in some varieties, new white shoots will appear at the growing tips of the rhizomes, which will begin to divide. Every kind of rhizomatous iris can be divided when these new white roots are showing. It's the after treatment that differs.

Rhizomes of bearded irises can be safely dried off for a few days, and sometimes for a few weeks, in early summer. Some, such as the sumptuous *onco-cyclus* irises, may be dried off and hung up in a shed until late autumn. These evolved in arid or semi-arid regions of Central and Western Asia where rain falls for only a few weeks in late winter or spring, and the rest of the year is dust dry. In a normal kiwi summer, these irises may rot in the garden.

An Illustrated Guide to *Hebe*

Hebe stricta var. *atkinsonii* (P.J. Garnock-Jones)

A major new research project at the Museum of New Zealand Te Papa Tongarewa

by Patrick Brownsey and Phil Garnock-Jones

Hebe is New Zealand's largest genus of plants and an iconic element of our terrestrial flora. It includes over 100 species, all but three are endemic to New Zealand. Hebes occur throughout the country, particularly in Riparian communities and in the alpine and subalpine zones, where they display a variety of growth forms. Many are widely cultivated, both here and overseas, and over 1000 cultivars are now named.

The most recent account of the genus is by Lucy Moore in Volume 1 of the *Flora of New Zealand* published 35 years ago. Since then botanical exploration has revealed many new species, whilst others such as *Hebe breviracemosa, H. armstrongii, H. cupressoides,* are now known to be rare or endangered. Also , molecular biology can now provide new insights into evolutionary relationships.

Earlier this year the Museum gained funding from the Public Good Science Fund for a 6 year biosystematic research project to determine the morphological and chemical characteristics, distributions and habitat preferences of all species in the complex and to test hypotheses about their variation and evolution by cladistic analysis. The main output will be a comprehensive and fully illustrated guide to the genus written for both horticulturists and botanists. Popular publications and scientific research papers will also be produced, and workshops run for special interest groups.

Leading the multi-disciplinary project is Dr Patrick Brownsey, known for his work on New Zealand ferns. He will be assisted at the Museum by a newly appointed post-doctoral researcher, Michael Bayly, who is completing a Ph.D at the University of Melbourne on the Australian genus *Eriostemon* (Rutaceae) and who will bring new cladistic and biogeographic skills from one of the world's foremost biosystematic schools. Two other research groups will collaborate with the Museum:

- Professor Phil Garnock-Jones from Victoria University of Wellington whose knowledge and previous research experience of *Hebe* will be critical

- Dr Ken Markham and Kevin Mitchell from Industrial Research Ltd who will investigate the flavanoid chemistry of *Hebe* to help resolve the relationships of the different species.

Completing the team will be botanist and leading plant photographer, Dr Bill Malcolm, renowned for two previous books, *The Forest Carpet* and *New Zealand's Alpine Plants - inside and out*. He will photograph all species of *Hebe* to show their habit, flowers, fruit and seeds to complement the text descriptions.

The project is already under way, but will gain full impetus when Michael Bayly joins the Museum staff in early October. Meanwhile, there are many other people already conducting research on various aspects of *Hebe* and we want to establish contact with them to ensure that our work complements what they are doing. We are establishing a database of all other Hebe research and would be interested to hear from people doing such work or who have significant collections of native species.

The two authors can be contacted at the following addresses:

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Exotic Trees in Wakehurst's Woods

by Mark Flanagan, Head of Collections at the Royal Botanic Gardens Kew, Wakehurst Place, U.K.

Introduction

The majority of visitors to Wakehurst Place are most often captivated by the ornamental collections close to the Mansion. The walled garden, with its cottage-style plantings, the Slips, resplendent with magnolias in spring, and the Winter Garden along with others are well known and much-loved features. Few are as familiar with the woods beyond the ornamental areas. However, exciting plans are unfolding in Wakehurst's woods and a remarkable collection of trees is developing there.

This collection serves to illustrate the diverse roles that living plants in modern botanic gardens have to play and the need for collection managers to make their activities relevant and focused as well as interesting and informative for visitors.

Historical Recap

The Royal Botanic Gardens, Kew assumed management of the Wakehurst Place estate (situated in the Sussex countryside, 50km south of London) in January 1965 in order to provide the space and opportunity to develop its hardy collections. In the mid-sixties the garden in west London was crowded and subject to air pollution. The curators' of the time didn't want to repeat the plant layouts and arrangements already in existence at Kew. The different soils, climate and topography at Wakehurst Place provided the possibility to do something different.

Historically botanic gardens were formed to teach botany to students and visitors, as well as providing plant material for taxonomic research. Therefore the collections were arranged botanically by plant family. Kew was no exception. Kew's arboretum brings together closely related trees from around the world. Thus the oak trees from North America are combined with those of Europe and Asia within an area set aside for the Fagaceae or beech family to which they belong. Similarly the maples from around the world can be found together in their designated area close to the Temperate House.

From the time that the arboretum was formed in the 19th century, however, thinking has moved on - How else might the collections be displayed? Could more natural and visually stimulating ways be found to grow the collections? Wakehurst Place has been at the forefront of this approach from the late 1960s when plans were laid, by Tony Schilling, then Assistant Curator, to develop the Himalayan Glade. This feature, within Westwood Valley, achieves its objective of bringing together plants that naturally grow together, regardless of their family relationships, in the high meadows and forest clearings of the Himalayas. Thus horticulture and ecology are married in an exciting and attractive way. With a small leap of the imagination one can see oneself following the yak paths through the Himalayan vegetation. As well as considering the actual arrangement of the collections many botanic gardens have also asked hard questions about the purpose and value of these collections. Shouldn't they have a more proactive educational remit and, perhaps, serve more applied scientific and conservation roles?

The development of the Himalayan Glade set in train a thought process which ultimately established a phytogeographic rationale for the tree collections at Wakehurst Place, quite different but certainly complimentary to those at Kew. In simple terms phytogeography is the discipline of understanding the origins and distribution of plants, where they come from, how they got there. What this has meant in practice for Wakehurst Place is the designation of particular woodlands for the plants of specific parts of the temperate world. Being a solely outdoor garden, without the benefits of protective glasshouses, only those plants which could grow outside could be considered and therefore tropical and subtropical species have been excluded. This process came to fruition in the early 1980s by which time the important woody flora of North America had been established in Horsebridge Wood, whilst Asian trees could be found in Westwood Valley and the less numerous southern hemisphere plants - from the more temperate parts of South America, New Zealand and Australia - were allocated to Coates Wood. Critically these geographic areas were seen in political terms, i.e. Asia was accepted as the area set out in atlases ranging from above the Arctic circle to the tropics. This definition was later to have significant implications.

Thus planting developed through the eighties with a clear focus. By the autumn of 1987 much had been achieved but many will know that the night of 16/17 October brought a great storm with hurricane-force winds to the south-east of England that profoundly changed the estate at Wakehurst Place. It is

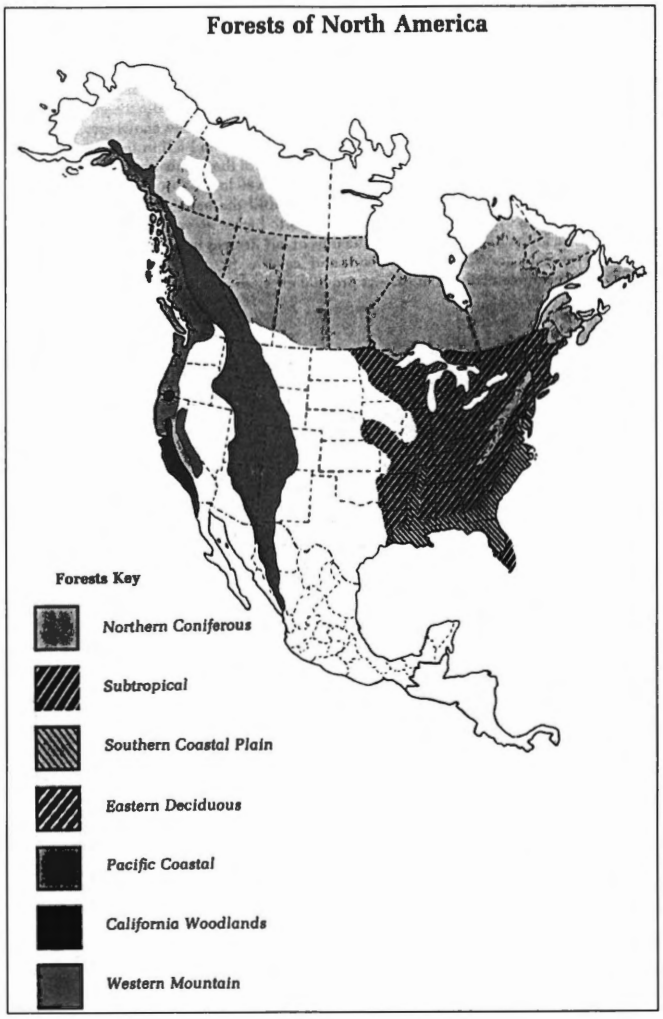


Fig. 1

estimated that between 15 - 20,000 trees were blown down across the estate in a few short hours. The mature exotic trees in the gardens were decimated. Prior to the storm Wakehurst Place had many 'Champion Trees' the biggest or fattest of their kind in the British Isles. A great many of these were lost or severely mutilated. The whole garden environment was changed completely. Following the initial work of making the gardens safe the monumental task of clearance was begun. A time frame of five years was envisaged for the task. Needless to say that the staff responded magnificently and working with specialised contractors completed the task inside five years. It was obvious that we also had to ask, and answer, some fairly difficult questions. Were the existing policies for the collections still viable? Had the storm rendered them obsolete? Could we still continue to plant as we had before?

Whilst this process was continuing I was invited to undertake a lecture tour to western Canada in the spring of 1989. Most significantly I was able to visit the forests of the Rocky Mountains and Coast Ranges in Alberta and British Columbia. This was my first real contact with temperate woodland in the wild. I was forcibly struck by the community nature of the forest I looked at, the mix of species involved, how certain species favoured wet sites or particular altitudes and how profound changes in the vegetation could take place over quite short distances - perhaps only the difference between an east or west facing aspect. What I was seeing was the whole dynamic process of ecology - the response of plants to their environment. This experience left a deep and lasting impression. At the same time I was also keen to acquire books on North American forests as none seemed to be available in the U.K. The most important book I acquired was "The Trees of North America' by Thomas Elias. Inside this book was a map detailing the nature of the North American forests (see fig. 1). It specified 7 accepted forest types. The contents of this book in conjunction with my visits to the forests stimulated a thought process and a germ of an idea began to form in my mind.

On returning to Wakehurst Place I felt that much more could be done with our North American plantings in Horsebridge Wood. Taking a lead from the Himalayan Glade, and the information I now had to hand, couldn't we develop them in a much more naturalistic way moving away from the random arrangement we had to one which brought together the trees from the accepted forest types as set out by Elias? I walked through Horsebridge Wood musing this question in my mind. We had made a lot of recent plantings, it would mean moving all these. The large established trees bore no relation to the new layout and couldn't be moved, did this matter? Could I convince colleagues that such a change was worthwhile, how would I present it? I went back again the next day and walked, and again the next day. As I looked the translation of the areas set out on Elias's map onto the ground within the wood almost seemed to determine itself. It seemed that the wet ground adjacent to Westwood Lake would provide just the right conditions for the swamp cypresses which were a characteristic tree of the wet forests of the south-eastern states. And the warm, sandy banks beyond would provide the right conditions for the Californian species. The existing mature redwoods, Douglas firs and sitka spruces close to Bloomers Valley also approximated to the Pacific coastal forests I had seen and could easily be underplanted. It all seemed to fall in place. I consulted with Andy Jackson who had, and still has, direct responsibility for Horsebridge Wood. He was supportive and enthusiastic. The case was taken to Tony Schilling who was convinced by the arguments. In the winter of 1990/91 a start was made by moving recently planted stock and adding new saplings to their designated areas. We began to feel that in time we could take our visitors on a walk through the woods of North America. An exciting, imaginative journey that would, metaphorically, span a continent.

Heady with the success we ploughed on. Andy's research had unearthed the work of Armen Takhtajan, an Armenian botanist who had proposed a phytogeographic arrangement of the entire world's flora and set this out in his book "Floristic Regions of the World". Happily Takhtajan's interpretation of the North American forests was close to that of Elias. Beyond this he had suggested how the complex forest of eastern Asia should be regarded, where to draw a line around the remnant forests of the Mediterranean and all the other parts of the world. In fact this seemed to be the bible for anyone interested in phytogeography. Was this the template for our collections? The first point to deal with was the fundamental divergence between what we currently had and what Takhtajan's arrangement suggested. His premise was a biological one, determined by the plants, not a political one determined by arbitrary human decisions. Thus his concept of Asia differed radically

from what we were working to in Westwood Valley. Takhtajan also set out temperate forests that we did not, at that time, represent.

It was felt, however, that none of these were insurmountable and that the value of adopting a biological arrangement was compelling - the collapse of the Soviet Union and Yugoslavia had shown the lack of longevity of human political structures and how atlases had to change. Research continued through the summer of 1991 so that a proposal was ready to submit to Kew. It envisaged a bold scheme that would attempt to represent the temperate woodlands of the world at Wakehurst Place. It wouldn't be comprehensive - space didn't allow, and it wouldn't be a re-creation of the natural woodland as this was too complex to attempt. This representation, as well as giving a strong collection and planning theme would provide enormous opportunities for education and, possibly, conservation initiatives.

The Scheme was accepted at Kew and endorsed by the Wakehurst Place Consultative Panel. The first plantings took place in the autumn of 1991. Since that time each winter has seen additions to the collections following our theme of 'a walk through the temperate woodlands of the world'. This collection rationale has also driven our seed collecting expeditions programme with visits to Taiwan in 1992, Argentina in 1993, Russia in 1994 and Pakistan and Mexico in 1995 all to acquire seeds that would provide the plants for our collections. It is important to understand that the scheme is underpinned by natural source plantings - plants from seeds collected in the wild - as these are the only ones of real value to plant scientists.

So how precisely is the collection arranged? Whereabouts in the gardens do you go if you want to see Mediterranean trees, trees from the Near East or those of temperate South America? And why have we said so little about this scheme hitherto?

Let's answer the last question first. Much of the stock we plant is small, often less than a metre in height. Whilst establishment is good and growth quick the trees take a long time to make an impression in the landscape at Wakehurst Place. In addition there are still gaps in our collection, areas we have designated and as yet have no trees available to plant. Our reticence in actively promoting the scheme, other than through a few preparatory articles and lectures, has been so as not to act too prematurely. Being closely involved with the scheme allows a certain amount of anticipation - knowing what areas will look like - this is difficult for first time observers and we have been conscious to avoid the 'so what' reaction! Now, however, the bones of the scheme are becoming evident as trees grow and develop. In parts of Horsebridge Wood, with five growing seasons behind them, many of the trees are creating an impression, as are certain parts of Westwood Vallley. The time is ripe to let people into our secret.

The layout is a bold one covering all the public parts of the garden except for the ornamental areas adjacent to the Mansion and the Pinetum. Takhtajan's classification divides the world into units in a hierarchical fashion a bit like an address. His highest unit is the 'Kingdom' of which there are six worldwide. Below this are Subkingdoms, Regions and Provinces. Each unit covers progressively smaller areas. Floristic analysis of this sort is based on grouping assemblages of plants with common origins together and it is the plants themselves, in forming predictable and characteristic communities, that tell him which are the appropriate groupings to make. The example, in layman's terms, we have to use to help explain this is - if a Japanese botanist was parachuted into Wakehurst Place in spring time, not knowing where he had been brought to, could he identify where on the globe he was? The answer is

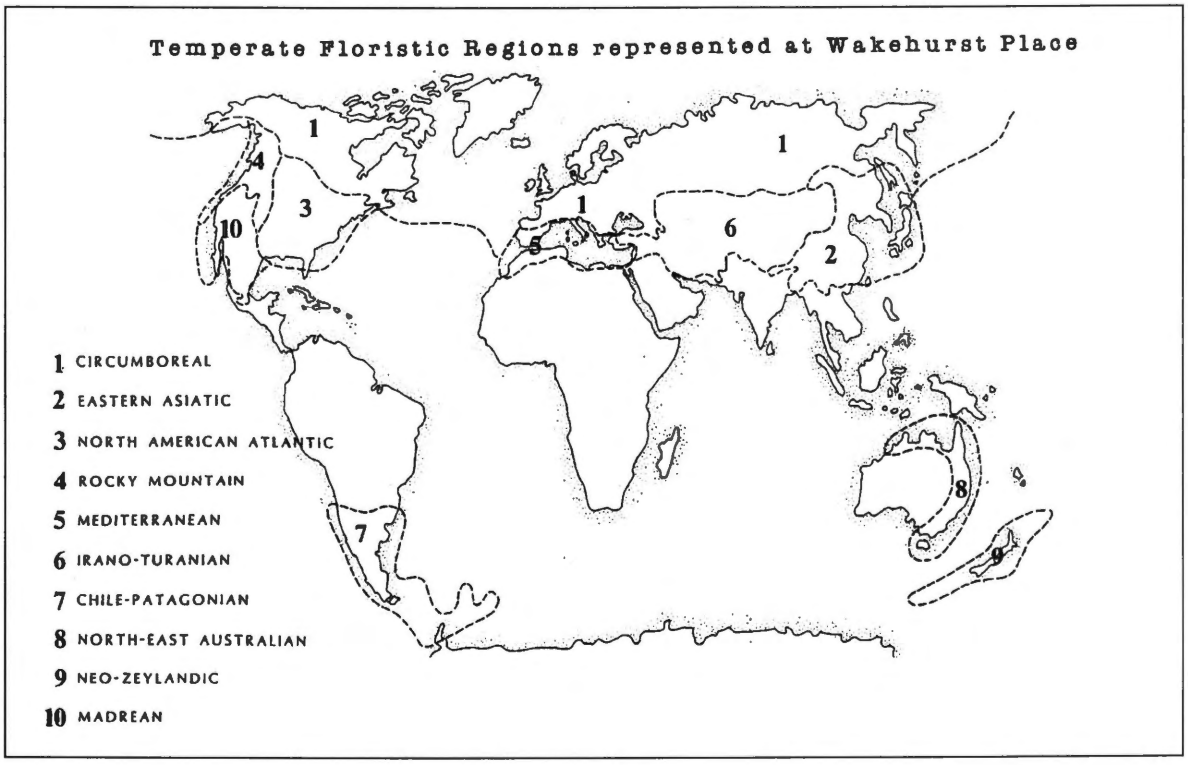


Fig. 2

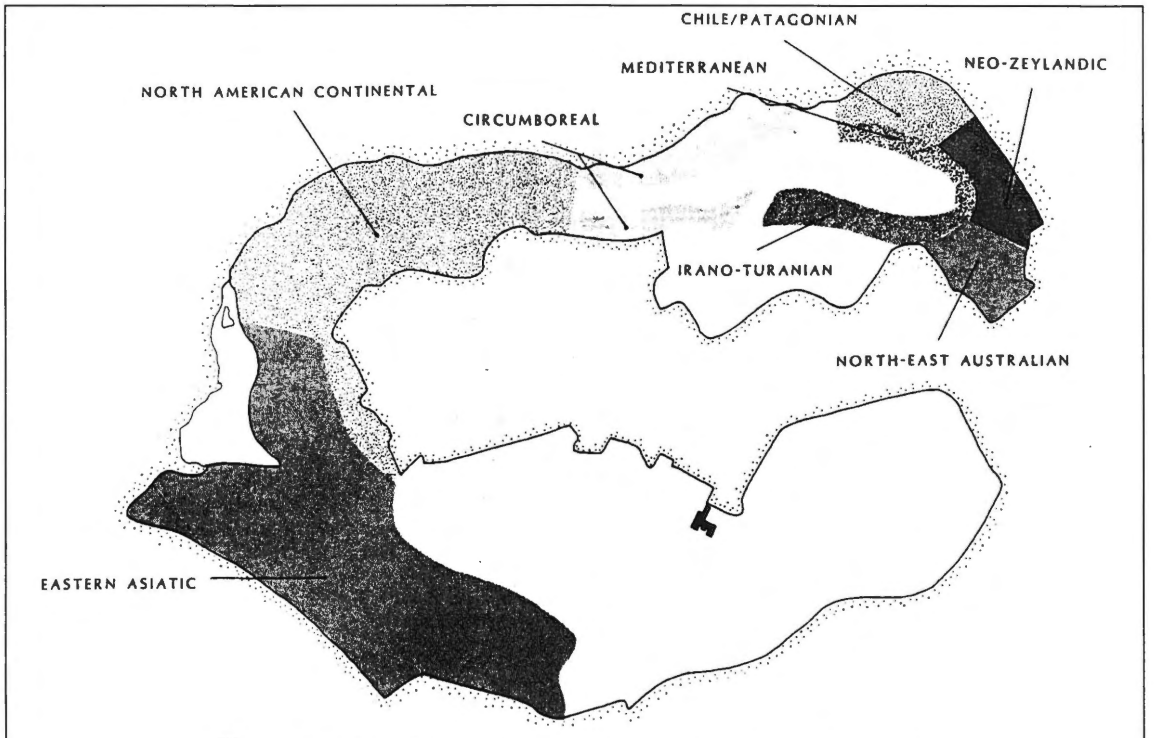


Fig. 3.

Wakehurst Place: botanical collections layout

yes, because he would use the plants around him - the bluebell woods, in particular, would be the key. The native bluebell (*Hyacinthoides non-scripta*), an abundant plant in the U.K. is actually not widely distributed and is not found outside of western Europe. This is also backed up by native oaks (*Quercus robur*) and other plants such as bramble (*Rubus fruiticosus*). Thus, our botanist would be able to say he was somewhere in north-western Europe. Takhtajan recognises this area as the Atlantic-European Province within the Circumboreal Region of the Holarctic Kingdom. On a global basis Takhtajan identifies the areas where floras change composition in order to draw the boundary lines between them by saying that this group of plants is sufficiently distinct from an adjacent one. The island groups that comprise New Zealand lie within their own Region (the Neo-Zeylandic) in recognition of their important and unique flora; their principal affinities being with the temperate parts of South America.

Figure 2 shows how Takhtajan has classified the flora of the temperate world at the regional level. The transposition of this classification onto the Wakehurst Place site is shown in figure 3. Some of the areas seen have their own subdivisions, thus the species-rich East Asiatic Region has 11 provinces designated. Overall the scheme has 24 separate units across the collections.

There is one other finesse to the collections which is most pronounced in Westwood Valley where the Asian collections are found. We are also attempting to show how the vegetation changes in response to altitude i.e. the higher up the mountain you go the cooler it becomes, until the conditions are too harsh for any trees to grow and you eventually meet perpetual snow (fig. 4). The Himalayas and mountains of western China have continuous bands of vegetation from subtropical elements to alpines. In Westwood Valley we have planted to attempt to show this with the three middle bands represented.

We have seen how our collection plan arose, how we have arrived at where we are now, but what of the future? We will manage and encourage the existing plantings ensuring they establish and grow to make tomorrow's trees at Wakehurst Place, with new plantings being added. Our future expeditions will help to bring further seeds back - visits are planned to China and Mexico this autumn, with Japan and western North America targeted for next year and we hope to collaborate with colleagues in New Zealand and Tasmania to undertake seed collections beyond 1997. Most importantly we will now slowly begin the process of helping visitors to understand and enjoy our collections and take the imaginary walk through the temperate woods of the world.

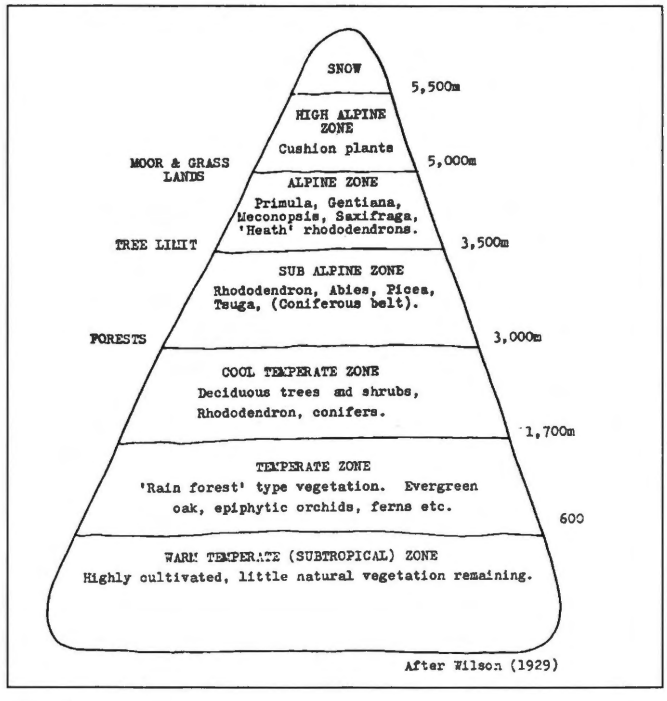


Fig. 4

Pulmonaria - an alternative to hosta

by Eric Walton

Pulmonaria *'Mournful Purple'*

It surprises me that *Pulmonaria* are not more widely grown. People who have seen the range of pulmonaria I have in my garden are always very interested. Perhaps more education and the recent push by nurserymen will help?

To me they have three main attributes. The first is that the leaves can be quite beautiful coming in various shapes and sizes, with patterns of spots and blotches of pale green, white or silver. Sometimes spotting can be silver over the entire leaf, something quite unusual for a woodland plant. New season's leaves develop after the flowers and remain in good condition throughout summer provided the plants are growing under reasonable conditions. Secondly, *Pulmonaria* flower from late-winter until late-spring, with flowers mainly in shades of purples, blues and pinks. There are also a number of cultivars with pure white flowers. Some species and cultivars appear to have flowers of 'mixed' colours, that is some pink and some blue. In those cases, the flowers open in pink and fade to blue. Those changes are likely to be associated with changes in pH (a measure of acidity and alkalinity) of the cells that comprise the flower. This happens with *Hydrangea*, where the flowers are blue when plants are grown in acid soils and pink when grown in alkaline soils. Lastly, the plants are generally pest and disease free. For these reasons, I believe *Pulmonaria* are excellent flowering foliage plants for shady locations in the garden.

The name *Pulmonaria* is derived from the Latin word for lung. It was believed the plant could be used to treat bronchial infections and lung diseases. In the Doctrine of Signatures, it was believed that when God created plants, He made them resemble the ailment they could be used to treat, that is, their signature! Presumably the spotted leaves resemble diseased lungs. Interestingly, one of the common names used for *Pulmonaria*, is 'lungwort'.

The genus comprises about 14 species all native to Europe. The plants are evergreen, although some cultivars tend to become somewhat deciduous during summer as the soil dries out. In early spring they come back into growth, and flower. After flowering, as already said, the new seasons leaves are produced. This pattern of growth makes identification a little difficult as mature leaves and flowers are not present at the same time.

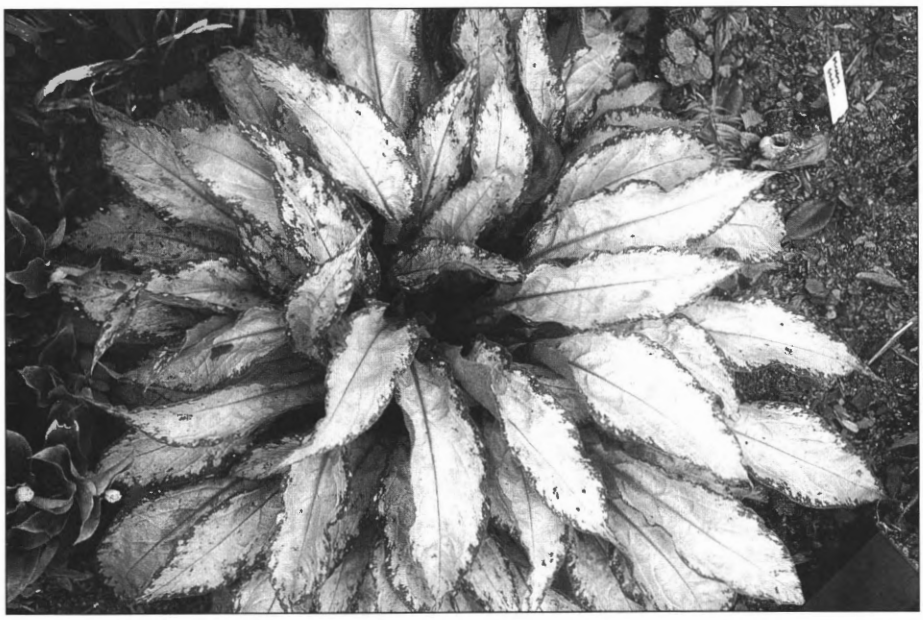
The species that I know to be in cultivation in New Zealand are: *P. angustifolia, P. longifolia, P. officinalis, P. rubra, P. saccharata* and *P. vallarsae. P. angustifolia* and *P. rubra* tend

to have plain leaves, free of spots. The form of *P. angustifolia* I grow is a relatively small plant with 'bluntly pointed' leaves and bright blue flowers. As *angustifolia* means 'narrow leaves', I guess it was named before *P. longifolia* was described scientifically. *P. rubra* has larger, quite pointed leaves and bright coral-pink flowers. *Rubra* meaning 'red' presumably relates to the flowers. *P. longifolia, P. officinalis, P. saccharata* and *P. vallarsae* all tend to have spotted leaves. *P. longifolia* has relatively long (hence the specific name), pointed leaves, approximately six-times as long as broad with purple-blue flowers. Flowers are also clustered together on the inflorescences, quite different from the other species. *P. officinalis* has cordate (heart-shaped) leaves with a very distinct petiole (leaf stem). *Officinalis* means 'of shops' and was presumably the species commonly sold for what ails you. The leaves of *P. saccharata* do not have such a distinct petiole as *P. officinalis*, being shaped more like those of *P. longifolia*, but are only two-to three-times as long as broad. *Saccharata* means 'dusted with sugar or sweet', probably referring to silver spots on the leaves rather than the taste, but one never knows! In contrast to the leaves of *P. longifolia, P. officinalis* and *P. saccharata*, which have a rather raspy feel, those of *P. vallarsae* have a much softer texture. This is due to the 'soft' hairs on the leaves of *P. vallarsae* as compared to the 'hard' hairs found on the other species. Unfortunately, I cannot find the meaning of *vallarsae*. The presence or absence of hairs at the base of the inside of the corolla tube (the tube formed by the fusion of the bases of the petals) is also a diagnostic feature. Having outlined the differences between the common species, the fun begins with the identification of hybrids!

Pulmonaria *'Lewis Palmer' syn.* P. *'Highdown'*

P. angustifolia is a good garden plant, very floriferous and one of the earliest *Pulmonaria* to start blooming in my garden. Years ago, while traveling around the south of the South Island, I visited a garden that had great sheets of this plant, all coming into flower - quite stunning and very beautiful. In the Waikato, however, it needs a relatively cool spot to flower well and tends to look a little scruffy by the end of summer. There are plants on the market as the cultivar 'Azurea', but whether or not it is the real thing, I cannot say.

P. rubra performs very well in my garden, although it can be a bit coarse and 'cabbagey', but is still a good plant. *P. rubra* is also one of the earliest blooming *Pulmonaria*, though some people find the flower colour a bit harsh. I am told that a cultivar 'Redstart' is sold here. Recently released was *P. rubra albocorollata* and it will be interesting to see how it performs. I think the white flowers and plain green leaves are a better combination than the white flowers and spotted leaves of *P.* 'Sissinghurst White'. Another probable *P. rubra* variety, also recently released, is *P.* 'Barfield Pink'. The flowers have red petals with white edging giving a somewhat banded two-tone affect. The first time I saw it I found it a little garish, but it does grow on you. Another recent release is *P.* 'Pierres Pure Pink'. I have yet to see this plant flower but according to the catalogue, it has 'salmon-pink flowers and nicely spotted leaves'. The best pink flowered variety I have seen is *P.* 'Abbey Dore Pale Pink', but I believe it is closer to *P. officinalis* than *P. rubra* given its spotted cordate leaves. In any case it has large flowers for a *Pulmonaria*, in the order of 1 cm across. They are pale pink, almost white in colour and suffused with a darker pink in the centres. Unfortunately, it may be some time before this plant is commercially available in N.Z.



Pulmonaria *'Excalibur'*

A truly different *P. rubra* cultivar is *P.* 'David Ward'. The leaves are a soft milky green, edged with white, and as one would expect, red flowers. British books recommend this cultivar is planted in more shaded locations than most other cultivars, so the leaves do not burn and turn brown.

P. longifolia is most commonly available in New Zealand as the cultivar 'Bertram Anderson'. This plant does very

well for me, with tight heads of small, bright purple-blue flowers, but I am sure it would do even better if given a better position! This plant grows well from root cuttings, as do all hybrids with *P. longifolia* in their parentage, because of their thick roots. If you are inclined to weed with a knife, you will soon have many small plants around your original *P.* 'Bertram Anderson' to give away. I have a plant that definitely has *P. longifolia* in its parentage, with dark pinky-purple flowers and beautiful spotted leaves. I do not know it's name, if indeed it has one, but it was suggested it might be *P.* 'Mournful Purple'. I have another very beautiful, mystery plant that looks like a hybrid between *P. longifolia* and *P. angustifolia* (leaves of the former and flowers of the latter). If not named, it should be! Another excellent *P. longifolia* type, is the pale-blue flowered variety *P.* 'Roy Davison'. It is not a big plant, but very floriferous. The leaves are wonderful, vividly marked with silvery-white and almost iridescent at dusk.

P. 'Sissinghurst White' is very popular and said to be a *P. officinalis* selection, presumably because the leaves are cordate. I think it is a bit over-rated as the white flowers are 'lost' among the white-spotted leaves. I do however, like the plant in summer when it is not in flower. Another white-flowered *Pulmonaria* recently on the market in New Zealand, is *P.* 'White Wings'. It will be interesting to see how it performs relative to *P.* 'Sissinghurst White'.

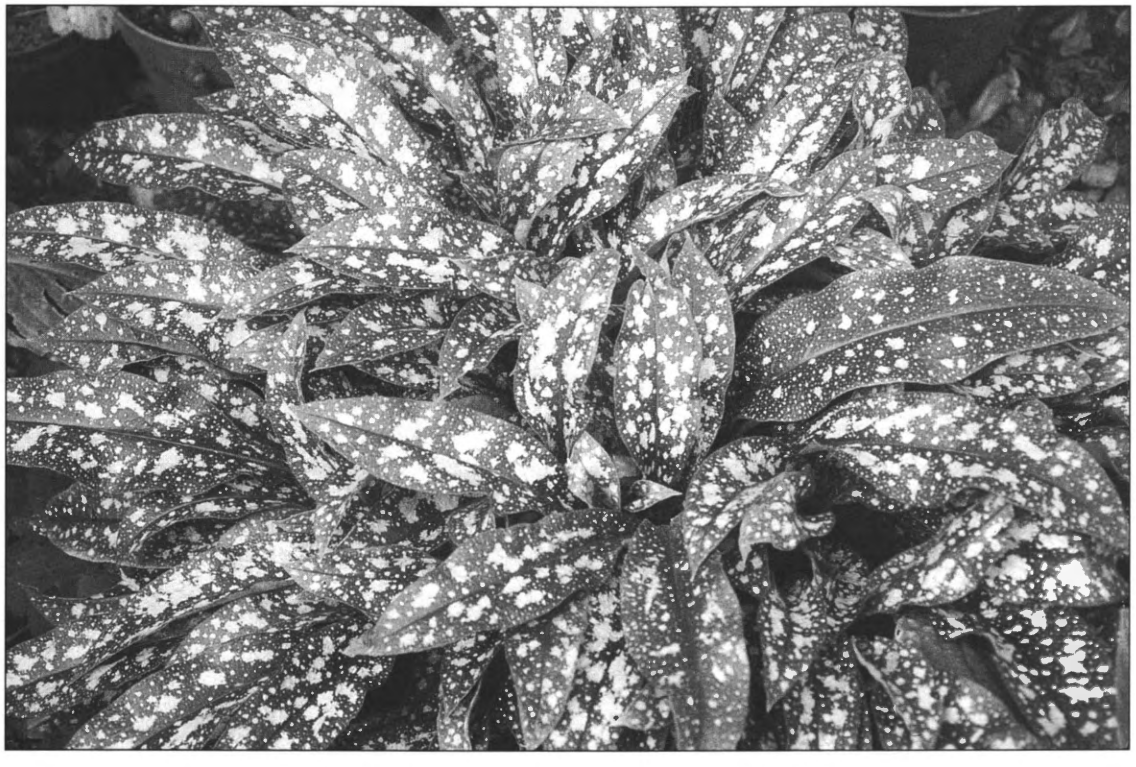
One of the best *Pulmonaria* I have grown is the medium-blue flowered plant, often sold as *P.* 'Highdown'. I understand it is the same as *P.* 'Lewis Palmer' from the aficionados in the United Kingdom, and so that is what we should now use! The leaves are relatively large, up to about 45 cm long and 11 cm broad, making it the largest *Pulmonaria* I grow, and each leaf has a few, large silver spots on them. Another *Pulmonaria* with bright blue flowers, new to the market is the cultivar, *P.* 'Little Star'. Its leaves are covered with small silver spots.

Another very nice *Pulmonaria* is what I was given as P. *saccharata* 'Argentea'. The leaves are pale green, and extensively blotched with silver. The flowers change from pale pink to a soft pinky-purple. It is very similar to the cultivar *P.* 'Margery Fish', said to be a selection of *P. vallarsae*. Two newish varieties that follow a similar vein are, *P.* 'Excalibur' and *P.* 'Spilled Milk'. Both were raised in the United States. After growing these two for a few months, *P.* 'Excalibur' appears to be the better, and an improvement on *P. saccharata* 'Argentea', based on leaves only, as they are almost entirely silver. When I have seen them all in flower together I will make my final judgment.

Pulmonaria are easily grown in fertile, free draining soils. I believe they look their best, in the Waikato, when grown in dappled shade. Like most plants they respond well to regular watering and feeding. *Pulmonaria* look better if divided regularly, because the leaves are then arranged more regularly and are aesthetically pleasing. Around mid-winter, before flowering, the dead and tatty leaves can be removed, to tidy the plants up before flowering. The only pest problems I have are occasional infestations of mealy bugs on the roots and at the bases of the leaves. A systemic insecticide is probably the best treatment.

Pulmonaria are readily propagated and division is an easy way for the home gardener to bulk up a particular cultivar. This is best done when the new leaves are mature about every three years depending on plant vigour. Ensure there is a reasonably sized piece of rhizome included with each division and do not plant too deeply or it may rot. Species and cultivars with thick roots can be readily propagated from root cuttings. I have never had the need to do this, but understand you cut them into pieces 2 to 3 cm long and place them vertically in a well drained mix. Each piece should produce a plant. This is best done in early-spring. *Pulmonaria* can be grown from seed, but then of course the resultant plants will not be the same as the parent. This could be a mixed blessing. You may get something new and exciting, but you could loose your named cultivar among a lot of slightly inferior seedlings.

If you are not already growing *Pulmonaria*, try a few, perhaps as a change from *Hosta*. I think you may be surprised! Several of the larger mail-order firms, each have a few different *Pulmonaria* for sale. Some of the same nurseries are importing new selections all the time, so, keep your eyes open. Alternatively, you can talk nicely to someone who has a few! A word to the wise - be aware that like *Hosta*, some cultivars are only subtly different. Don't let that put you off, they are wonderful plants.



Pulmonaria *'Roy Davison'*

Southern Alpines - an International Alpine Conference in New Zealand

Story and Photographs by Charlie Challenger

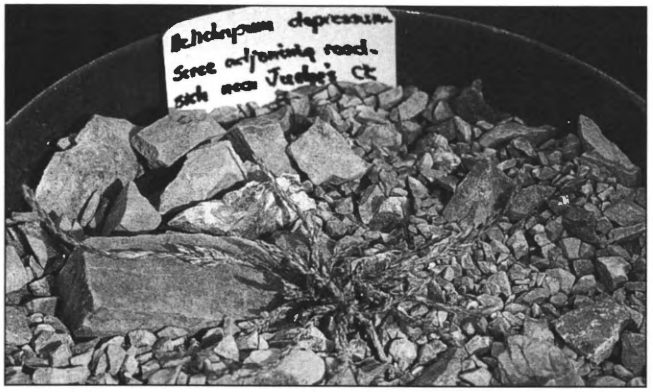
New Zealand recently had the honour of hosting an international conference on alpines of the Southern Hemisphere. Alpine plants have been popular in cultivation for many years, due to their small size and floriferous nature. In recent years they have also become subjects for serious scientific study, as botanists examine the various mechanisms which have evolved, allowing them to cope with their harsh environments.

"Southern Alpines", hosted by the New Zealand Alpine Garden Society, was a deliberate attempt to draw attention to the alpine plants of this hemisphere. Nine International or Interim International Alpine Plant Conferences have been organised since the first, held in 1936, but largely they have dealt with the cultivation of alpines from Europe, Asia or America. This conference was the first to deal solely with alpines of the Southern Hemisphere. This widespread net has a logical source from the common origins of these lands in ancient Gondwanaland. The holistic nature of the earth and its manifold inhabitants is increasingly being recognised, so it was very appropriate that the underlying relationships amongst floras of the wide-spread lands of the Southern Hemisphere should be an underlying theme of this conference.

A further contributing factor, of course, is the increasing interest in countries of the Southern Hemisphere as a source for garden plants. Until quite recently S.E. Asia has been the dominant centre for plant collecting, and the names of collectors such as George Forrest, Frank Kingdon Ward, George Sherriff, Frank Ludlow, and Roy Lancaster - the most recent of them and still active, spring readily to mind. Of course, New Zealand, Australia, and South Africa have been actively botanised for many years, but until quite recently South America has been badly neglected. So the efforts of recent collectors in South America from about 1970 onwards, such as John Watson, Martyn Cheese, Jim Archibald, and Robert Rolfe, who have concentrated on the plants of the alpine zones, complementing the early classic, but more lowland collections of E.K. Balls, Harold Comber and Thomas Lobb et. al, have been most valuable. But plant collecting and plant identification go hand-in-hand, each requires the other to progress - and the floras of South America are still relatively incomplete. No one institution has accepted responsibility for research on the nomenclature of plants from this vast area - as did the Edinburgh Botanic Gardens with the collections from Asia, or for the Flora of Turkey. But of course, from such deficiency does opportunity emerge, and individual workers in various university botany departments are slowly filling some of the gaps. The scope is wide, and will remain so for many years to come.

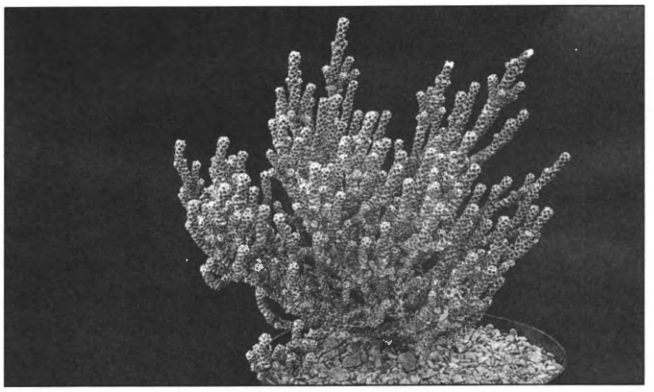
75% of conference delegates came from countries outside New Zealand, so it was appropriate that speakers were almost as widely spread, exploring particular floras and their biology, or the cultivation of southern alpines in specific environments. To horticulturists, determined to cultivate every plant which comes their way, this latter aspect perhaps had greatest appeal. True New Zealand alpines - from above the bush-line, which are protected from winter moisture in their natural environment by snow cover, have a reputation for difficulty in cultivation. This was strongly underlined by Harold McBride in his paper "A Northern View of Southern Alpines". McBride, a well-known British enthusiast, with a first-rate reputation as a cultivator of New Zealand flora, reported that there, most of the collections of celmisias, aciphyllas, astelias, and Australian endemics were in the hands of specialist growers, able to provide the perfect drainage required during winter months with raised gravel or scree beds.

New Zealand cultivators also emphasised the problems of growing in our own environment. Lawrie Metcalf, until recently the Director of Invercargill's Parks and Reserves,

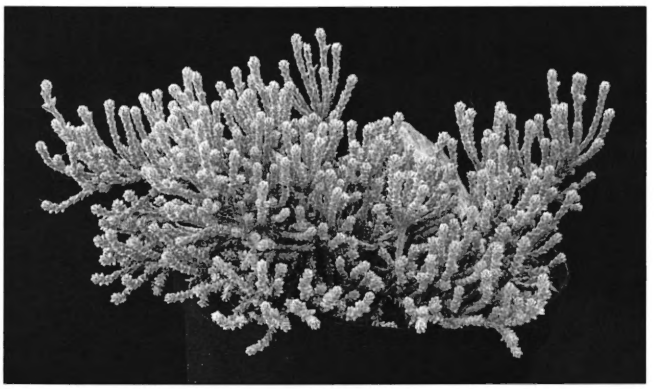


Helichrysum depressum
(One parent species)

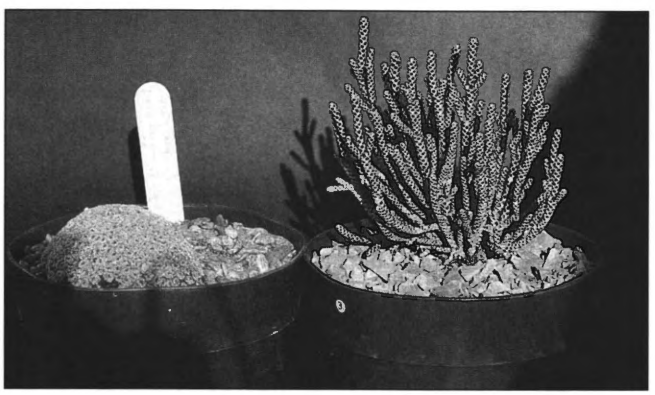
X



Helichrysum coralloides
(the other parent species)



The hybrid from their crossing



Raoulia eximea (left) and
Helichrysum intermedium

And the hybrid from their crossing

Plants from the exhibit by Dr. Josephine Ward and Grant Bawden

and well known for his innovative use of New Zealand natives in the city's public gardens, discussed his experience in the cultivation of celmisia species. Some are easy, so that whole beds can be reliably grown; others are much more exacting. In particular, the large rosette species which are amongst the most beautiful, are some of the most frustrating to maintain in cultivation. One point of particular interest which he noted, was that some species, carried in cultivation through several generations, do appear to evolve a greater ability to persist than when first collected from the wild. Joe Cartman, whose 1985 book on "Growing New Zealand Alpine Plants" is a bible for the dedicated enthusiast, discussed his experiences in Canterbury. The weather in Canterbury can be very hot, dry and windy, whilst at the same time in the Alps it may be raining or snowing and cold. To grow in lowland Canterbury plants which have evolved in response to these alpine conditions must involve measures to keep unwanted weather at bay. Few New Zealand growers do take this trouble, which is relatively commonplace in Britain.

Perhaps the most superb example of this care which the Conference showed lay in the collaboration between Dr. Josephine Ward (Canterbury University) and Grant Bawden on those legendary plants, *Raoulia* - "vegetable sheep". Over the years it has been realised that hybrids between subgenera of *Raoulia*, and *Raoulia* and related genera, are not uncommon in the wild. As an essential aid to the botanical study of these hybrids cultivation techniques had to be pioneered by Grant Bawden, enabling living plants to be always available within reach of the laboratory. The collection of living specimens with which Dr. Ward illustrated her paper was one of the finest which has ever been on display.

Horticulturists always complain of name changes, but the advance of knowledge as new, and previously unappreciated relationships are discovered and investigated, makes this inevitable, irritating though it may be. Sometimes this process - the botanist calls it "revision" - also leads to the discovery of new species. Dr. David Given's account of work on *Celmisia*, and Peter Heenan's paper on shrubby legumes of New Zealand will, in the near future, undoubtedly lead to new or adjusted species in these groups. Modern methods of investigation, using cytology, such as chromosome counts, or chemical analyses, where apparently related species show distinct chemical contents which cannot have come from a common ancestor, mean that purely visual relationships can be no longer totally relied upon in plant taxonomy.

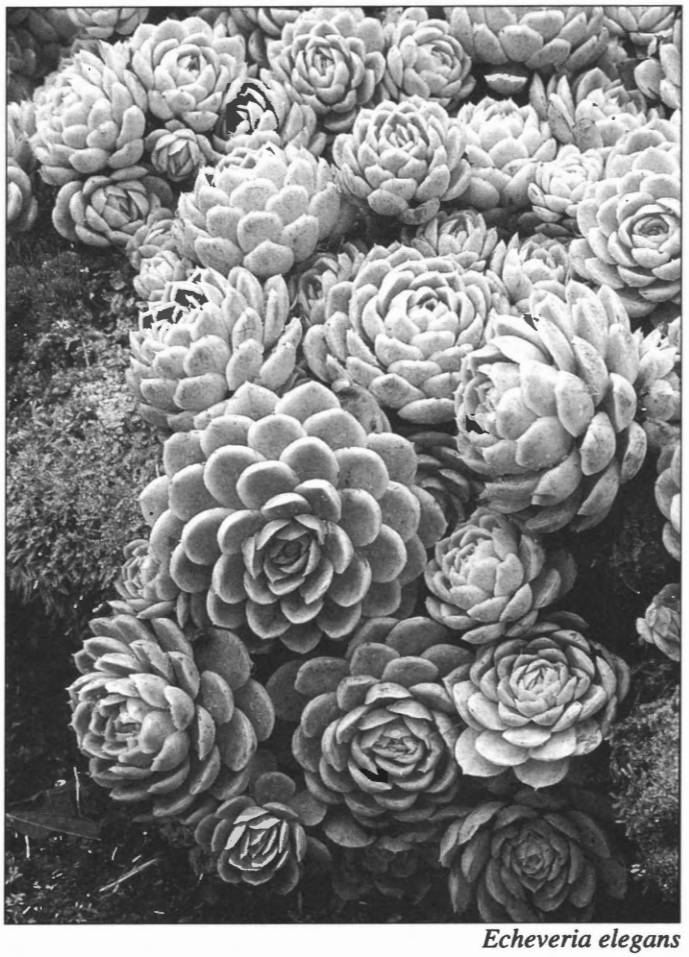
Conference organisers were fortunate to obtain the services of John Watson, who has collected widely in the alpine regions of South America over the past twenty five years. It is due largely to his efforts that the U.K. Alpine Garden Society's new "Encyclopaedia of Alpines" is so comprehensive in its coverage of alpine plants from that part of the world, for almost one fifth of its over 500 colour plates come from Watson's camera. His paper on "Alpines of Argentina, Bolivia, Chile and Peru" was one of the highlights of the conference. Besides illustrating a tantalising range of plants, a major theme was to analyse their success - or otherwise- in cultivation. When Watson commenced collecting in 1972, the "received wisdom" of the time was that many desirable Andean plants, such as rosulate violas, could never be grown. But as his paper showed, this was no longer the viewpoint of the experienced cultivator. Peter Erskine's paper on "A Gardener's Selection of *Oxalis* and *Viola* from the Southern Andes", discussing his success in their cultivation in Britain, further proved the point. Erskine stated, quite categorically, that though success in germinating and growing *Viola* has been uncertain, they are not as intractable as once thought, but added the rider that the gardener needs to proceed with caution in selecting those to grow! Watson's paper collated cultivators' results from his seed collections; many species are now already regarded as "established in cultivation" in Britain.

Several papers were concerned with problems of conservation, not the least of which rises from eco tourism. Alpine floras are exceedingly sensitive to pressure, and where human activity - be it development, recreation, or just the wish to see floras in the wild - coincides with a fragile plant/environment balance, actual management at this interface has to occur. Dr. David Given, whose seminal book "Principles and Practice of Plant Conservation", sponsored by the World Conservation Union and the World Wide Fund for Nature, has recently been published, summarised the problems and outlined considerations involved, in his paper "Prospects for Alpine Floras in the South". Amongst the questions he raised for future solution were the guardianship of polar-alpine plants, the best ways to protect alpine environments, the resilience of alpine plants to disturbance, and the role of horticulture. This latter aspect has very real potential for horticulturists, although there are still differing opinions on, for example, the impact of seed collecting as a precursor to establishing threatened localised endemics in cultivation. But Roger Good in his paper on "Alpines of South East Australia", commented on the prospects of combining in-situ conservation with ex-situ propagation, which has been practised in some revegetation programmes in Australian Alps National Parks under considerable pressure from skiing.

The New Zealand Alpine Garden Society, who organised this world-wide conference (participants attend from 12 overseas countries) was founded in 1960 as the Canterbury Alpine Garden Society. Today, rising from the initial 28 foundation members, there are over 800, with membership spread to 28 countries overseas. The Society is currently editing the papers presented at the conference for issue to participants. It is hoped that they will be available for purchase by other interested parties. Please notify the Secretary, NZAGS, P.O. Box 2984, Christchurch, if you would like to be informed when copies are available.

Succulents in the Park

Story & Pictures
by Vonnie Cave



Echeveria elegans

It is seven years since I made the rash statement that I could grow enough pieces of succulent to plant the rockery area at the Bason Botanical Reserve, Wanganui. As a member of the Friends group I had become rather critical of the untidy mixture of old plants, bulbs, and shrubs covering this north facing area and realised it had the potential to be a much more interesting garden.

Echeveria multicaulis

The rockery had been set up on this sunny slope by the original owners, Stan Bason and his wife Blanche many years ago and the plantings had become straggly and unattractive. An employee of the Wanganui City Council which administers the garden worked hard in cleaning up the area and removed most of the bulbs and roots to reveal quite large pockets of soil across the slope banked up by large pieces of shell rock which is available in the Wanganui area.

During February and March of that year I spent many afternoons planting up trays of pieces of succulents, a pleasant task as succulents are easy to handle and there is no fuss about wilting or watering or even keeping them cool. The cuttings are better in fact if they have been picked a day or two ahead of planting so that the stems can dry a little. A member of the Friends had a large number of old wooden seed trays that had been used as drying trays for gladioli corms and a short outing with the farm truck soon had them home and ready for filling with mix. The City Council obliged with a suitable quantity of a very free draining mix that had crushed stone, pumice, sand and bark as the main components and I was soon happily lining out neat rows of the many succulents, all quite attractive, even at this early stage.

Fortunately we had an open sunny area with a slight slope to the north that I was able to use as a standing area for the trays and this proved ideal as little frost hit the succulents during the winter months. The trays needed very little watering during March and April, just occasionally after a hot dry week, and it was soon evident that all the cuttings were rooting and growing well.

Prior to planting

The estabished garden

In October we loaded all the trays, and there were forty two of them, onto the farm truck and drove them to the Reserve. Four or five Friends were there to unload and space out the trays over the various pockets and we tried to arrange the different coloured groups so that pleasing contrasts would be achieved. The plants were all nicely rooted and easy to plant out and gave a certain amount of instant colour. Within 6 months they were looking great and everyone was pleased with the excercise.

Since then, four to six of our Friends group has weeded and dead headed the succulents once a month, sometimes missing out January when little weed growth occurs. This limited amount of maintenance has kept the rockery looking interesting and no watering has been necessary over the driest of summers. None of the succulents in this garden are prickly so they are friendly to work with, but because some of them are brittle, care is needed when working around them and they don't like being walked on. We all look forward to our working bees, which usually take only one and a half hours, depending on the weed growth and the number of helpers.

Two or three pockets were lifted and replanted after five years as the plants were getting straggly and we had a problem with numerous seedlings of the bulbless oxalis, *Oxalis corniculata*, growing under the succulents. We took a skim off the top of the soil, which is fairly heavy in that part of the district, and added some old untreated sawdust to the pockets involved. The crowns saved from the tops of the original plants were replaced and have filled in again with foliage

The blue succulent, *Senecio serpens*, has been the quickest to increase and spread in the garden and we have cut it back several times around the edges. We also prune off the flower heads as they are not very attractive. *Echeveria gibbiflora* in a metallic pink shade stands out against other succulents and *E.elegans* is a very neat tidy filler which inhibits most weed growth. Its pale grey colouring is also useful in showing up deeper colours.

Other pockets have been filled with *Echeveria pulvinata*, *Pachyphytum kimnachi*, *Graptopetalum paraguayense*, and *Kalanchoe pumila*, while *Aeonium arboreum* 'Schwarzkopf' is a magnificent dark maroon in the background. A few small groups of other succulents have been added gradually for interest and many visitors now enjoy sitting in the sun beside the planting, and wedding photographs are often taken in this area which has a wonderful view over the valley within the Reserve.

Having had several years involvement with this succulent planting I am convinced that it is ideal for the situation and feel this type of garden would be valuable in many other sites.

Towards a Better Town Belt

by Roger Still, Town Belt Curator, Wellington City Council

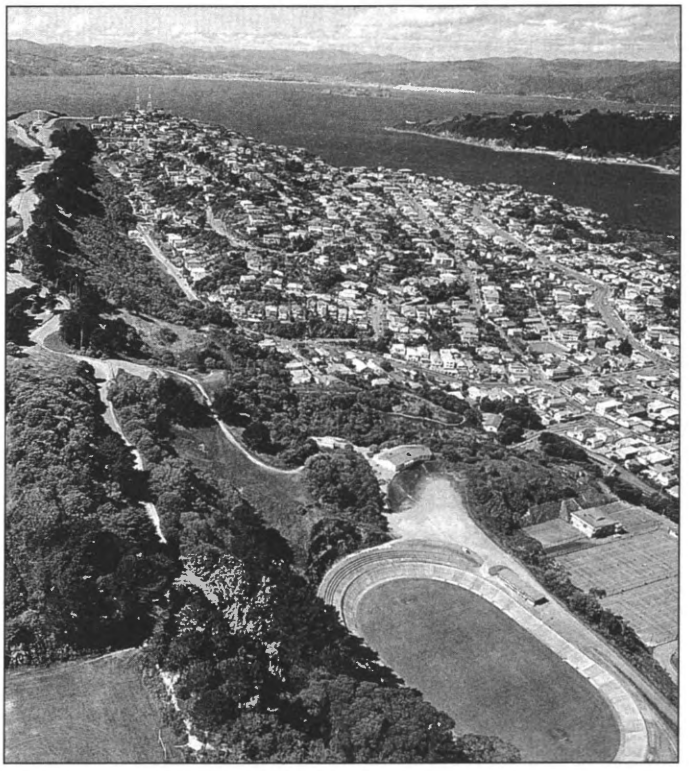


Fig. 1

By world standards Wellington has a beautiful natural setting, and it is fair to say that the Town Belt plays a significant role in this by helping to define the city's landscape character. It provides a scenic backdrop to the inner city and helps to give the city its sense of belonging and definition. The Town Belt is not just a scenic backdrop for the central business district. It is also a valuable resource offering tremendous recreational opportunities to residents and visitors.

This paper discusses Wellington's Town Belt and explains some of its history. It outlines the impact the Town Belt plays on the city's landscape character, and its significance as a citywide resource helping to meet the recreational needs of more than 150,000 people. More importantly it explains how the Town Belt, particularly it's vegetation cover, is to be managed and enhanced in future years, and the role this will play in continuing to "green" New Zealand's capital city.

History

Wellington owes much of its character to its Town Belt, the area of protected hills that surround the Capital, which have been predominantly planted, although there are some pockets of natural regeneration. In the 1990s Wellington is fortunate to have such a significant recreational resource within 5 minutes easy walk of the city centre. The credit for this lies in the forethought and revolutionary ideas of the New Zealand Company back in 1839 during the early stages of European settlement of New Zealand. An asset such as the Town Belt is quite unique in world terms.

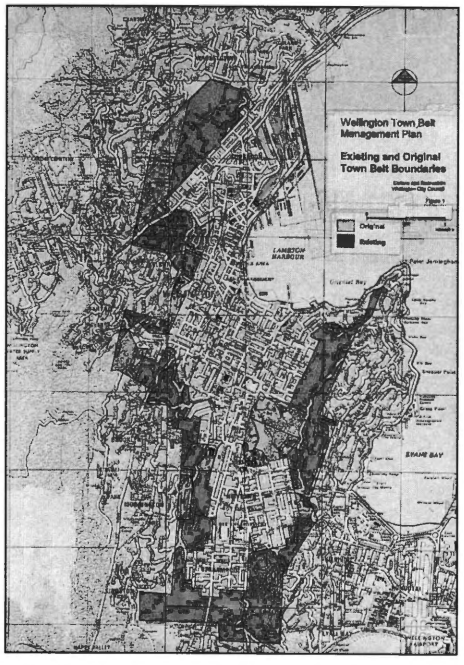


Fig. 2

At the time of design and layout of the town of Wellington, instructions were given that a Town Belt was to be set aside. With overcrowding in Britain and limited access to public lands, some 625 hecatres were set aside as "common recreation land" for the new settlers. The hills surrounding the new community were set apart with the intention of separating town from country sections, never to be built on.

Over the years the "horse shoe" shaped Town Belt has sadly been reduced by more than one third. At 425 hectares however, it still represents a significant proportion of the city's overall open space. In total there are more than 2,500 hectares of land within the city in protected status. The Town Belt represents about 20% of this. Its location within the city and its close proximity and ease of access to most suburbs makes it strategically more important. A study of the Town Belt maps (fig.2) show the land remaining in protected status today, and the land that has been "lost". Some of the "lost" areas have since been returned to the community as public lands, but are not formally protected by way of the Town Belt Deed.

In 1873 control or guardianship passed from Central Government to the Wellington City Council. So special is the Town Belt, that land can only be removed from its protective status by an Act of Parliament or proclamation. Land can come under the protective umbrella of the Town Belt Deed in a similar manner. Prior to 1873, much of the original Town Belt had been taken by Central Government for a variety of purposes, with no known compensation offered to Wellingtonians for this loss.

The Crown took lands for Hospital, Education and Post & Telegraph purposes, as well as for a Lunatic Asylum. This latter property is today used as the Governor General's Residence. It is rather alarming that the southern third of Tinakori Hill which visually and physically forms part of the Town Belt, is now owned by Telecom with American interest. Similarly it is of concern that the most visible portion of the Town Belt (the summit of Mt. Victoria), is not legally protected as part of the Town Belt Deed. The Mt. Victoria summit is nevertheless held by Council as a 'pleasure ground'.

As the city expanded, parts of the Town Belt were also taken for roads and other public works. It is fortunate that 150 years on, nearly two thirds of the original Town Belt remains subject to the 1873 Town Belt Deed and other parts are held by Council under other forms of protective status. This has occurred as a consequence of 'good luck' rather than any overall strategy.

Use and Development

At first the Town Belt was simply an area of open space close to the city for people to enjoy walking, picnicing and sightseeing. It was not uniformly covered in vegetation. Settlers and Maori began to clear the vegetation and by the late 1870s most of the Town Belt was in pasture and grazed. Grazing continued up until the mid 1920s. Some areas were however planted.

From the turn of the century to about 1925, *Pinus radiata*, macrocarpa and eucalypts were extensively planted to beautify the hill slopes and control the spread of noxious plants. Pine plantings peaked around 1915. Very little planting occurred after 1925 and generally plantings were not actively managed. As the city grew, so did the need for recreation facilities and open space. Expansion and development resulted in gullies being filled and sports fields established. Today there are numerous sports clubs located on the Town Belt covering a range of recreation activities such as bowling, netball, croquet, tennis, rugby, soccer, and hockey. The Wellington Botanic Garden once formed part of the Town Belt. The Zoo as well as the Berhampore Public Golf Course are on Town Belt land. Community and interest groups, such as scouts, pottery and drama groups, similarly occupy parts of the Town Belt.

The hilly nature of Wellington has had a strong influence on

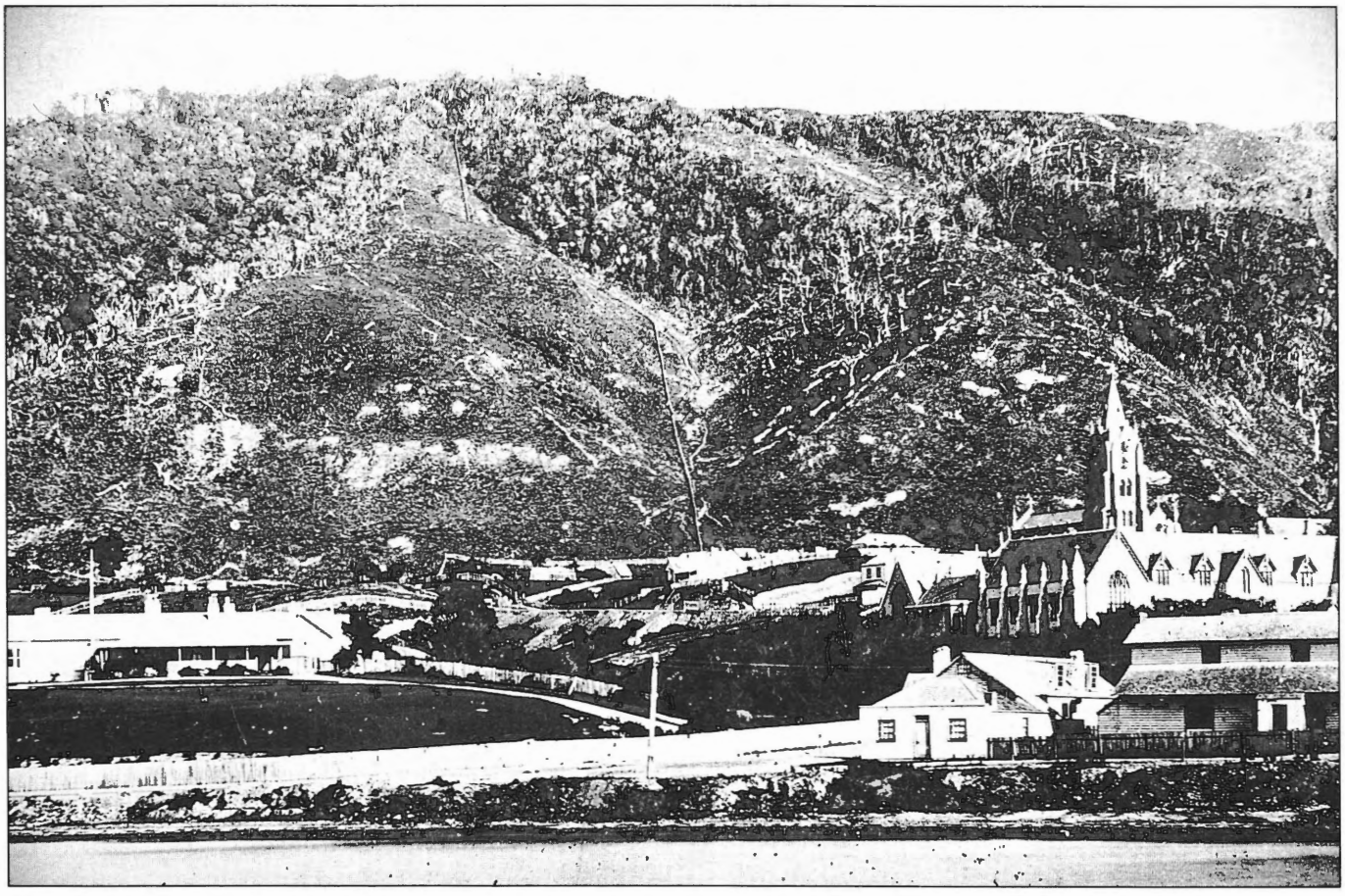


Fig. 3. Forest clearance: Tinakori Hill 1867. The remnants of forest seen here give some idea of the dense native forest that originally covered most of the Town Belt. D.W. Davis Collection, Alexander Turnbull Library.

past development of the Belt, and today much of it is covered in regenerating native species and exotic vegetation.

Since its establishment over 150 years ago, management and development, including the planting of trees, occurred in pretty much a haphazard way. In recent times the community and City Council have become acutely aware of how the Town Belt ought to be managed, developed and enhanced. Proposals to use parts of the Belt for a variety of public, private and commercial purposes increased public awareness of its vulnerability. A recent application to establish a gondola up Mt. Victoria with a conical shell shaped restaurant on the skyline generated considerable public debate and highlighted the risks and potential to exploit the Town Belt for non recreational uses. The Wellington community also became much more conscious of just how much of the Town Belt had been lost over the years like "slices of salami". Each slice having little impact by itself, but collectively reducing the whole. Sadly many of these alienations were for non-recreational purposes. Management, development and the taking of land were generally considered on a one-off basis without regard for the entire asset. It was clear that Council as guardian and trustee of the Town Belt could no longer sustain this form of management if the Town Belt were to survive.

Management

Work on a comprehensive draft Management Plan commenced in 1991. Public participation was a central theme in this process, with the community being invited to outline their aspirations for the area. After more than 100 years of acting as trustee it was rather surprising that very little resource data had been formally recorded about the Town Belt. This meant a lot of background work needed to be carried out as part of the Management Plan process. Separate background reports were prepared by technical specialists on the area's ecology, Maori and European history, landscape, recreation, and forestry values, as well as the past and present administration and management trends.

Given the size of the Town Belt, the variety of landscape cover and topography, and the different recreational and community uses being accommodated, the Town Belt was divided into nine separate Management Areas for the purpose of preparing the draft Plan. These were largely based on topography and communities of interest. While some management policies would be common to all parts of the Town Belt, it was clear that some areas would need individual policies to cater for their particular circumstances. Clearly the policies for the Berhampore Golf Course would be different to the policies advocated for the forested Tinakori Hill.

With detailed background data, and valuable comments received from the community, a draft Management Plan was prepared and released for public comment in May 1994. Because of the enormity of the Town Belt, and the large number of people that it affects, it was decided to double the usual consultation period from 2 months to 4. Submissions closed in September that year. During this second phase of consultation, public awareness of the Town Belt was heightened by the generation of newspaper articles and debate at a series of public meetings as well as a telephone hotline.

The final plan is in two parts. Part I is the generic volume applying to all of the Town Belt, while part II is broken down into 9 separate volumes dealing with each of the management areas. The information and policies contained within the individual management area volumes are supplementary to those contained in the generic volume. As part of the consultative process in preparing the Management Plan, every recreation club leasing a part of the Town Belt was written to as were resident, conservation and interest groups. Those neighbours who, through time, had illegally extended their private properties onto the Town Belt were also approached. In total more than 140 submissions were received, some very detailed. Many were from interest groups such as the Wellington Branches of Forest and Bird and the Royal N.Z. Institute of Horticulture representing a large number of members.

Key Strategies in Management Plan

Perhaps the two key policy areas in the approved Management Plan relate to revegetation and recreation although illegal private use by adjoing property owners is another important issue.

In terms of the overall recreation strategy, the Plan essentially advocates that there should be no additional Town Belt lands developed as formal sports fields. Rather existing facilities need to be better managed. The Plan also advocates that where possible, lands previously removed should be returned to the Town Belt's protection.

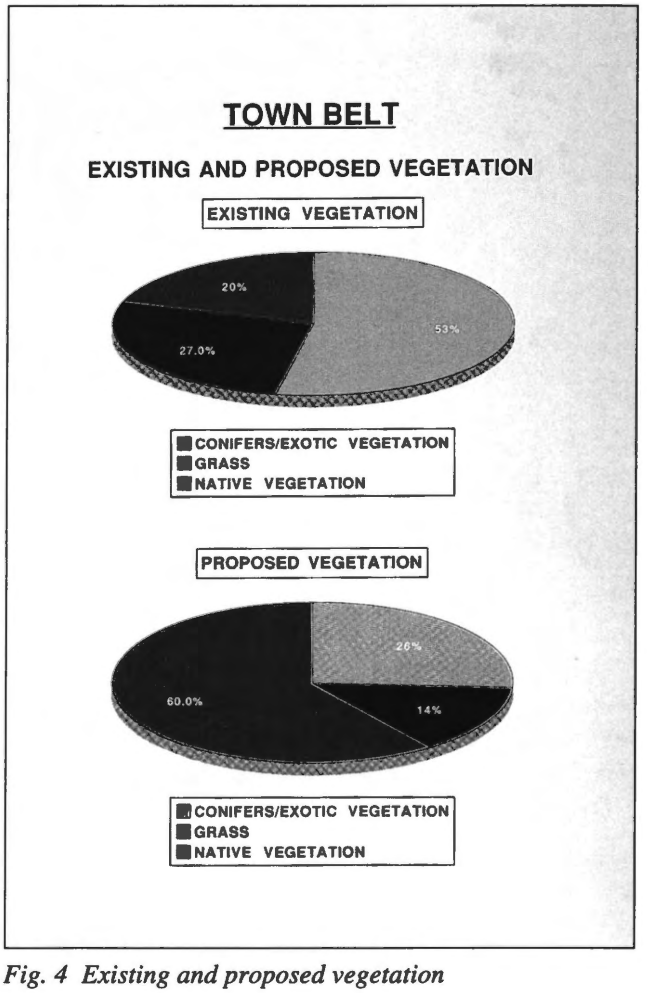


Fig. 4 Existing and proposed vegetation

The main thrust of the vegetation strategy is to progressively establish New Zealand native species indigenous to Wellington on a much greater proportion of the Town Belt with the amount of cover increasing from 20% to 60% or 92 hectares to 254 hectares. The existing vegetation consists of 53% exotic conifers and broadleaf exotics, 27% grass and 20% native species. The long term strategy is to change the composition to 26% exotic conifers and other exotics, 14% grass and 60% native species. The long term strategy is that the moist east facing slopes are converted to native species, while the drier west facing slopes are proposed as an exotic conifer/eucalypt mix. Detailed research was carried out with the vegetation types of the nine management areas individually mapped from aerial photographs and extensive field work and then digitised on computer. For each management area, composite maps were drawn to show how the cover would ultimately look. Several photo montages were prepared showing the suggested vegetation changes (fig.3).

Implementation of the revegetation strategy is expected to extend well beyond the year 2020, with the community and groups like the proposed "Friends of the Town Belt", playing an important role. To ensure that an overview is given to the Town Belt's management and development, the Management Plan also advocates that a Curator position be established within Council.

Towards a Better Town Belt

The Management Plan is the first stage in a long term management strategy. With the Curator position as the pivot point, the work can now commence together with some consistency to Council's guardianship role. Revegetation, encroachments, rationalising boundaries, addition of land, establishment of the Friends network and the creation of a new walkway to name a few, can all be actioned. Works involving the provision of new and existing services and utilities will also be actioned through the Curator.

It is pleasing that many of those people who encroached onto the Town Belt have been contacted and are prepared to discuss how best their situation might be resolved. It may be some time before all illegal encroachments are satisfactorily dealt with.

As a result of submissions received, the Management Plan advocated that a new walkway be established taking walkers from the central city out to the south coast. Excellent progress has been made on this walk which will travel from the Bolton Street Memorial Park, through the Botanic Garden, the Mount Street Cemetery and Victoria University, before heading down Devon Street into the Aro Valley. From there it heads up Epuni

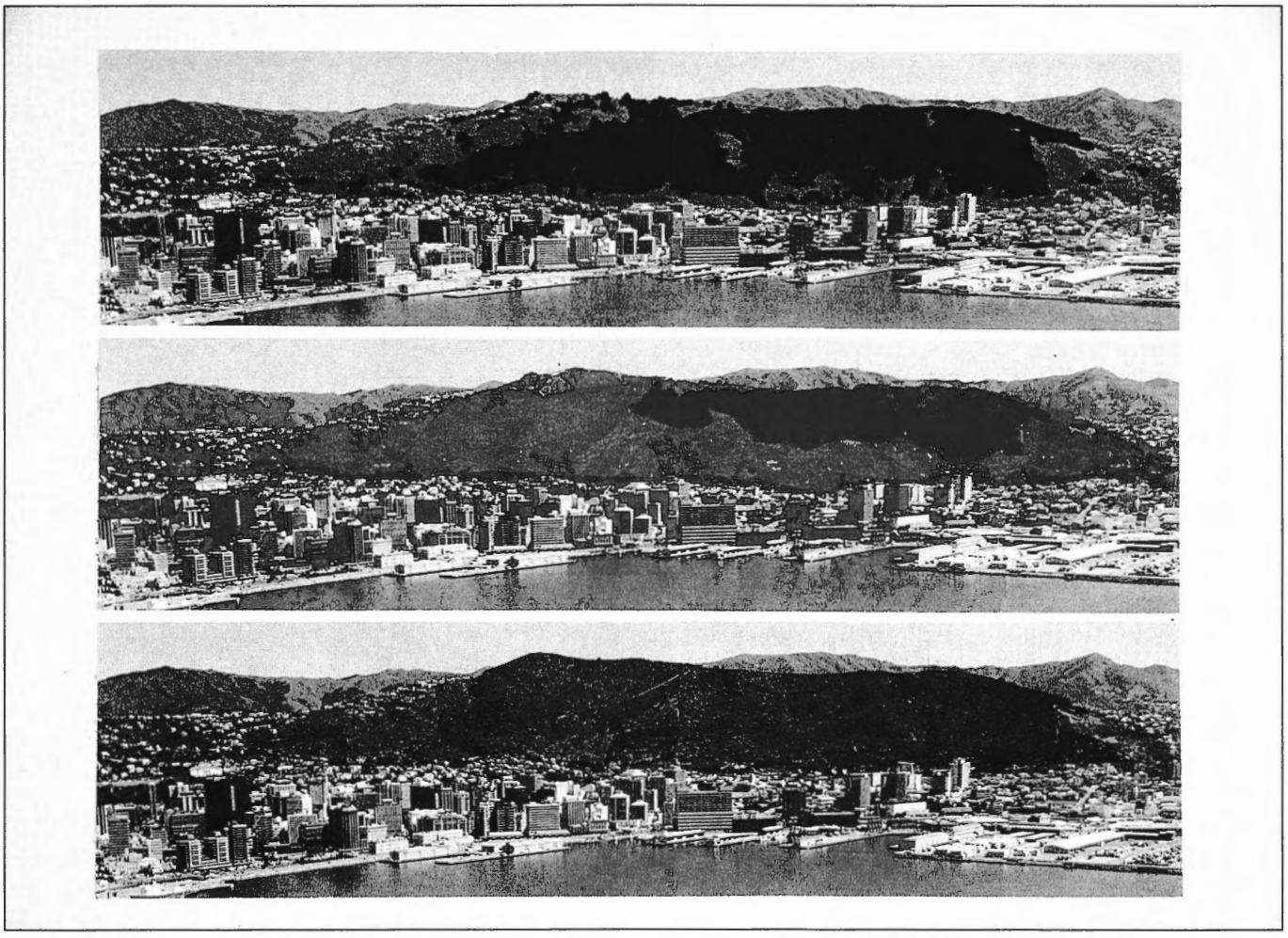


Fig. 5 Photo montage showing the vegetation changes on Tinakori Hill from pine/eucalypt mix to native vegetation over 40 years

Street, across Tanera Park and Central Park before heading up Bell Road and skirting across the hillside above Prince of Wales Park. From Hutchinson Road, above the Show Building, walkers will make their way to Macalister Park and the reservoir before dodging not too many wayward golf balls as they cross the Berhampore Golf course. Walkway users will eventually exit the Town Belt in the Kingston area on Quebec Street. From this point they can wander downhill through the proposed reserve lands on the Council's Murchison subdivision and will either end up at Ohiro Beach or make their way to Shorland Park in Island Bay. The walkway mainly uses existing tracking networks.

[*Update - The first stage of the City to Sea walkway was officially opened on 20 July 1996. This takes walkers from the central city to the far side of the public golf course at Wakefield Park. Stage two out to the south coast will be developed within 12 months.*]

The revegetation programme has started. The Wellington Branch of Forest & Bird have been carrying out a planting programme for some years. With the completion of the Management Plan, they have been able to focus their planting programmes in terms of the broader schemes outlined in the Plan. Previously native spcies were propagated at the Council's Berhampore Nursery and planted out. There was no certainty that these plantings were in conformity with any scheme or master plan. Both the Nursery and Forest & Bird are now clearly able to plan their activities. Despite some difficulty providing plant material propagated from local seed source, part of the summit of Mount Victoria will be planted this winter.

In recent weeks problems have been experienced with a few pines on Tinakori Hill falling over. This has caused some concern to local residents. While the long term strategy is for the pines to be removed, it is interesting to speculate how the 'problem' can be resolved. Do nothing and let nature take its course or be proactive and remove some or all of the trees? With either option there are various consequences. The unknown factor is what effect removing some trees will have on the remainder of the stand. They could for example be more likely to fall as a result of wind. With the selective removal, there will be an immediate visual effect. In conjunction with the Council's Arborist, consideration is presently being given to this situation and what is the best option.

Last year for the first time ever Council was able to plan Arbor day planting on the Town Belt in terms of the approved long term revegetation strategy. With assistance from Forest & Bird and several schools, plantings took place on Tinakori Hill, Mt. Victoria and Mt. Albert.

Discussions are ongoing in respect of re-acquisition of lands previously alienated. Work has also started on rationalising the legal anomalies that exist, such as Ruahine Street and the Mt. Victoria tunnel. This involves including and excluding land from the Town Belt. This work will take more than 18 months and first involves defining most of these lands by survey. Developing the Town Belt Friends group has not yet commenced. Such a group will differ from the proposed Council honorary reserve rangers. While the Friends and honarary rangers might interact and compliment each other, the Friends would be more involved with promoting and replanting the Town Belt rather than acting as a policing body. It is important to have clear guidelines for both groups and adequate training and resources to do the jobs properly.

Council as managers and guardians of the Town Belt need to respond quickly to users requests. The Management Plan has so far proved very useful when dealing with the various applications received. Town Belt policies have also provided a guide in relation to other city reserves.

The preparation of the Plan took several years to complete and involved a large team. It is pleasing that the N.Z. Recreation Association recognised the significance of the document last year (1995) when it awarded the Plan one of its annual Industry Awards. All those involved in its preparation can be very proud of the work achieved.

The Wellington Branch of the Institute of Horticulture in their submission on the draft Plan outlined a set of six principles in respect of the proposed revegetation strategy. These ranged from protecting the Town Belt, particularly the skyline as a visual backdrop to the city, recognising and preserving the special values of the area, providing for horticultural educational use, and promoting the area for informal recreation. The approved Town Belt Management Plan incorporates many of these aspirations. Like other interest groups, the Branch is willing to have an ongoing role in the future of the area and is keen to discuss their views of future management and development. Their input is valued.

Summary

The Town Belt is very much a city asset, precious to the community. Too much has been lost already and Wellingtonians now realise this. How the Town Belt is managed and developed in the future is something that the community is deeply interested in. The completed Management Plan is the community's plan with policies applying to Wellingtonians as well as to Council as trustee on behalf of the citizens. Having agreed on a common goal for the Town Belt, future developments and plantings will be planned, rather than carried out in the ad hoc manner of the past. The revegetation strategy is an ambitious but achievable one.

The facilities located on the Town Belt form a significant part of the City's recreational infrastructure. At the same time the Town Belt provides the heart and lungs of the City's green character set against the Port Nicholson Harbour. As greater demands are placed on the Town Belt for outdoor recreation and commercial activities, the Management Plan sets a clear direction for the future, something that has not been available before now.

The Plan is the starting point of a long term process, and will lead to further land acquisitions, rationalisation of existing uses and the commencement of a major long term revegetation programme. Most importantly future management, including replanting will be carried out in a consistent and planned

manner. The revegetation programme alone will significantly transform the landscape character of the city, and enhance the scenic backdrop offered to numerous suburbs. Native birds will be attracted to the area. The Town Belt will continue to be awarded special status requiring an Act of Parliament to remove any land from its protection. Most importantly it will play an ongoing role in maintaining the green and beautiful character of Wellington.

A new Town Belt concept is currently under action. This is the Outer Town Belt which will extend along the western hills from Karori through to Mt. Kau Kau and northwards. Excellent progress on this concept has been made over the past 20 years with Council acquiring or protecting various properties as and when they become available. It is hoped that future Wellingtonians will look back and admire our efforts to establish an Outer Town Belt, in the same way that we look back and thank our forebears when they set aside the present (inner) Town Belt back in 1840.

The Wellington City Council has a large portfolio of reserve and open space lands. The Town Belt forms a significant part of the city's open space assets. Council accepts the significance the Town Belt plays in the community and has agreed that considerable financial resources be budgeted in forthcoming years to implement the Plan. It might be that organisations outside of Council might also want to take an interest in the conservation values of the city and could be persuaded to contribute towards projects like the revegetation programme.

With everyone's help, Wellington's Town Belt will continue to be recognised and enjoyed as a valuable recreational resource. More importantly we can look forward to working 'Towards a Better Town Belt'.

RNZIH Awards and Honours

The RNZIH runs a comprehensive system of awards and honours for both members and non members. There are also two major scholarships awarded annually, each for several thousand dollars. For detailed information on these please write to the RNZIH for a copy of the Awards and Honours booklet. The cost is $5. The awards are briefly as follows :

Associate of Honour (AHRIH)
Awarded to persons who have given distingished service to horticulture in New Zealand. Only 60 people can hold the award at any one time.

Fellow (FRIH)
Awarded to members who have made a significant contribution to horticulture and the Institute.

Sir Victor Davies Award
Awarded annually to a young person who has demonstrated an outstanding plant knowledge. The recipient receives a certificate plus monetary prize.

Plant Raisers' Award
Awarded to an individual or organisation who has raised in New Zealand a cultivar(s) of outstanding merit.

Ronald Flook Award
Awarded by the New Zealand Arboricultural Association to a person who has contributed to the advancement of arboriculture in New Zealand.

D.D. Baker Memorial Award
This award is designed to assist members undertake research or study which will contribute to the advancement and benefit of horticulture in New Zealand.

Peter Skellerup Plant Conservation Scholarship
A scholarship granted for research, field work, publication, propagation and/or cultivation of plants and any other activity likely to promote and assist the conservation of New Zealand's indigenous and exotic plant genetic resources. The award in 1997 will be approximately $5000.

NOTE THAT APPLICATIONS FOR ALL AWARDS CLOSE ON 31 MARCH 1997

A Standard Method for Tree Evaluation - STEM

Ron Flook AHRIH

A standard method of evaluating trees is essential for all those who have to make decisions about the importance of trees and their preservation, whether in urban or rural situations.

There have been difficulties in the past in making such assessments without recourse to a standard method. This thorny problem was initially alleviated by the *RNZIH Tree Evaluation Method for New Zealand* published in 1988.

Publication by the RNZIH in 1994 of *An Introduction to the Notable Trees of New Zealand* which listed over 2000 registered trees allowed work on an improved tree evaluation method, called STEM for short. Work on this method has continued for four years and many changes have been made following public comment.

STEM has been developed for everyone; both professionals and lay persons who have to make decisions about trees. Consultation and field trialing started publicly in August 1994 when the fifth draft was launched publicly at the First NZ Tree Symposium in Rotorua.

The method was circulated widely to major national professional bodies and qualified persons. Numerous public discussions and talks with community groups were also held. Without exception STEM has been welcomed and helpful comments made in support of the work. Field trials of over 600 trees have been conducted by members of the New Zealand Arboricultural Association (NZAA), Nelson City Council, Nelson Tree Planters, and by interested individuals. Nelson City Council was one of the first local authorities to use STEM Draft 5. In their experience the method was very satisfactory and enabled them to make sound judgements on the hierarchy of important trees in the Nelson region for listing on their Preliminary District Plan.

The consensus has been that STEM is uncomplicated by formulae or flawed by multiplications which other systems use. It is also clearer in definitions which will make it more useful at Planning Tribunal and local authority planning hearings. The work includes definitions of the terms used and a glossary of common arboricultural words. It is designed for adaption to many and various geographical conditions.

STEM has been approved by general opinion to:

- be readily understood
- be easy to use in the field
- give conservative results

In the assessment of an organic object, the essential ingredient is Objectivity. STEM is a logical method for establishing the intrinsic quality of trees. STEM is also able to set a monetary value based on their evaluated quality. However, it is essential to avoid monetary claims being regarded as unreasonable or excessive. A conservative approach is essential even thought it may be emotionally disappointing.

Standards New Zealand and the Resource Energy Division of the Ministry of Commerce are interested in STEM and regard it as an 'industrial draft'. They accept that it will be widely used although not documented into their form of legalese, which they will need to do. Due to the considerable interest in obtaining the document the NZAA have asked that it be published now as they wish to make use of the method. STEM is to be launched in October at the NZAA Conference, in Auckland.

Book News and Reviews

Supported by Touchwood Books, specialist horticultural booksellers of Hawkes Bay

'Gentlemen in my Garden', 'Deities in my Garden', and 'Handbook for the Baffled Gardener'

A trilogy written by Fay Clayton. Published by GP Print.
Price $19.95 each
Reviewed by Steve Benham, Records Officer, AucklanRegional Botanic Gardens

The book titles 'Gentlemen in my Garden', 'Deities in my Garden' and 'Handbook for the Baffled Gardener' aroused my curiosity to such a pitch that I just had to read this trilogy from cover to cover.

Fay Clayton is obviously a brilliantly accomplished writer, linguist, researcher and gardener with a deep love of plants and how they earned their names.

These little soft covered volumes have been attractively produced and enhanced by numerous pencil sketches by Phillip Hart.

In this age of voguish books and magazines awash with colour I found these books in monochrome delightfully refreshing.

'Gentleman in my Garden' explains the derivation of generic plant names associated with people be they botanists, physicians or ancient Greek scholars. They are all to be found in this treatise.

Fay muses in an opening chapter titled 'On Exotica' how one rarely encounters familiar indigenous floral icons on arriving in foreign parts. Unfortunately this passion for exotics appears to be a worldwide trait!

The genus *Leschenaultia* has often been rather a misnomer as it often appears in the most respected of references as *Lechenaultia.* Fay informs her readers that the genus honours Louis Theodore Leschenault de la Tour, 18-19th century French botanist.

The second in the trilogy is 'Deities in my Garden' whereby Fay recalls personalities from old mythology used in the naming of generic taxa. Nomenclature is once again brought to life by Fays colourful and lively use of words. She delves into the dynamic mythology of those ancient Greek civilisations and recalls how Hebe was the goddess of youth, a daughter of Zeus and cup-bearer to the gods on Olympus. Her most special ability was to rejuvenate the heroes!

Fay convinces me that Greek mythology is by far the richest of the worlds mythology, the most precise and all embracing available to modern man.

The third and final in this review 'Handbook for the Baffled Gardener' again deals with the origins of generic names commemorated by using Greek derivatives describing the flower, seed, tree, leaf, fruit, scent, colour etcetera.

I was intrigued by the derivation of the generic name *Cyclamen.* I had always thought it was from the Greek *kyklos,* a circle alluding to the peduncle of the flower as it sets seeds and coils downwards. Fay refers to the circular shape of the corm.

The genus *Aloe* is mentioned as being a tropical genus. In fact 150 species occur in the temperate regions of S. Africa (E.van Jaarsveld per comm.,1996).According to 'Families of Monocotyledons' by Dahlgren *et al* the rengarenga, *Arthropodium* has been placed in the family Anthericaceae and not Asphodelaceae.

Fay Clayton has most certainly succeeded in making what can often be a rather dry and heavy subject into one that is both informative and a joy to read. This trilogy is overflowing with fascinating facts, stories and is scholarly accurate.

I wholeheartedly recommend fellow gardeners and botanists to browse through them if you have the chance.

A History of the Garden in New Zealand

Edited by Matthew Bradbury. Viking 1995
Price $59.95
Reviewed by Walter Cook, Alexander Turnbull Library

In a sense, garden making is a human ritual. Through this activity we relate to the natural world, transforming it and

bending it to our cultural imperatives. We have been doing this to a greater or lesser degree for more than ten thousand years.

In New Zealand it is possible to claim that our greatest achievement has been the creation of an economic and cultural landscape based in agriculture, horticulture and forestry. The Neolithic heritage is common to both Maori and Pakeha. Yet books dealing comprehensively with the history of this in New Zealand have been a long time coming. It is the fundamental matrix of our lives as a settled human society, but has largely been ignored by social and cultural historians here. Gardens, I think, have been, and are central to this history. The Garden is the primeval model for the transformation of the earth into the productive, precarious human artefact that it is today. Without the garden we would be quite a different sort of culture.

A History of the Garden in New Zealand does not deal with all aspects of the subject. Maori gardens were entirely economic, producing crops for consumption. One of the Pakeha equivalents is the vegetable patch, but others are surely the orchards, vineyards and paddocks of crops that supply the same need today. Nor does the book look closely at out national parks and native forest reserves. These are gardens too in the sense that they survive today through human intervention to conform to our human concepts and values. In order that nature as it is does not have its way, we weed them of invasive plants and rid them of other pests that we have introduced. They have now, more in common with the parterre than with their original pre-human autonomy. Then there is the greatest garden of all, our national lawn, the function of which is both economic and aesthetic. For those of us who have descended from an old world Neolithic heritage, after the earth itself, pasture is the ground of our being. Hence, perhaps, the suburban obsession with lawns and lawn mowing in the absence of grazing animals. Cultural conformity and racial memory.

The book largely deals with those gardens which we gather around ourselves for food, pleasure, and the display of conspicuous consumption. As far as I am aware, it is the first attempt to give a comprehensive overview of this subject for New Zealand. Given the nature of historical interpretation, and the fact that research into New Zealand history is still at an exploratory stage, its statement is bound to be provisional. This is expressed in the title and the structure of the book which is a collection of essays by different people, not all of them from horticultural backgrounds. As a result there is a range of separate statements and styles. The shape of the book also results from the emphasis of much garden historical research to date, which has tended to focus on the nineteenth and early twentieth centuries. For example, the development of public parks and gardens for much of this century is not covered - an important topic in relation to the urbanisation of New Zealand and changes in the ways we live and use our cities. In Wellington this resulted in the rebuilding of the recently established Frank Kitts Park in the 1980's to provide a multi-purpose urban venue for outdoor events as well as for passive recreation. Sir Truby King's garden at Melrose exists today as an historic garden undergoing restoration, but it is also one of a new generation of public parks in the city. Its present function and meaning is different from that which lead to its creation.

Design fashions and their origins, and the economic and social forces influencing the shape and use of our gardens are well covered in the book. The missionaries used both the bible and horticulture in their strategy to convert and civilise the heathen. In the twentieth century, a similar, but secular agenda was held by the leaders of the Christchurch beautifying Society. The collective garden suburb of the state house era asserted community values that were the antithesis of those expressed in gardens designed to serve the enlightened self interest of the share market boomers. Economic depression and war affected the priorities of home gardeners. It is a fascinating story.

Three chapters by Katherine Raine covering the development of Pakeha gardens from the time of settlement to 1920, make up the core of the book. Within this section John Adam has provided short bulletins on selected public parks and gardens with general information leading to their development in New Zealand. Preceding this is a very good chapter on Maori gardens by archaeologist Susan Bulmer, and another on the main garden traditions of Europe with an emphasis on England and North America by Matthew Bradbury. This chapter is also about the ideas that shaped our garden traditions. The author has obviously read, and givers a clear account of writers like Knight, Uvedale Price, and Burk who reshaped the landscape of the mind in relation to the sublime, the beautiful and the picturesque. Information in this chapter relates to Katherine Raine's accounts of 19th century New Zealand gardens where even the simplest might include design conventions originally promoted by great practitioners like Humphrey Repton. Even our early conservation estate is not immune from these ideas. In the 1900's the Scenery Preservation Commission reserved native forest to provide tourists with picturesque views along our roads, railways and rivers. Almost everything we touch in New Zealand provokes international echoes. Maori gardens developed a local adaptation within a larger Polynesian tradition.

The period from 1920 to the present is covered in the last three chapters. Those by Louise Beaumont and Douglas Lloyd Jenkins relate well together in terms of style and approach. Though common social and cultural imperatives informed the periods before and after the Second World War, there were important differences affecting the meaning and purpose of our gardens. War, economic depression, and concerns about the health and moral fibre of the race in the first case, and affluence, international modernism and the beginnings of a Pacific awareness in the second. New suburban architectural styles required changes in the look of gardens, and from the 1950's the concept of 'lifestyle' and leisure began to change the relationship of the garden to the house. But throughout this period the garden as an expression of fixed gender roles within the context of the nuclear family continued - the man growing vegetables or

escaping out the back; the woman growing flowers in the front when she wasn't working in the kitchen.

Today such fixed roles and the nuclear family are giving way to a diversity of family structures and modes of life. Pluralism is the catchword of the 'post modern' movement. As our older, cohesive society fragments, overwhelmed by economic liberalism, the international mass media, and global culture, there is no single cultural focus that we can relate to. This has affected the styles and meanings of our gardens. We are left to devise our own meanings, histories and narratives. In a pluralist world here life is but a spasm and history a whiz, cultural eclecticism is inevitable. Culture becomes a supermarket with, among many others, a garden section. From it, those who can pay, select garden styles in much the same way as they choose wallpaper and fabric patterns. There is something nightmarish about Rodd Barnett's account of the last 30 years of the twentieth century. But in many ways I found it the most stimulating and challenging section of the book. In part this was because of the author's tendency to use current academic glossolalia called post modern discourse. I read it three times and I still can't be certain whether I've understood it. It is a chapter that also cause the hackles of many of my prejudices to rise. His account of the environmental movement contains a nice piece of satire, and in discussing the cottage garden in modern New Zealand he touches on a subject the history and narrative of which are certainly a recent creation. I also agree with his suggestion that in New Zealand there never was a country garden that was not a suburban garden, and also that a colourful heterogeneity typifies the New Zealand garden in this post modern movement. The latter with this proviso - that relatively speaking, this could always be said of New Zealand gardens, even when the environment of signs was less mobile.

The book is lavishly illustrated in black and white and colour. Many of the images come from the archives of our national heritage collections.

Rosa gallica

By Suzanne Verrier. Published by Florigium, Australia.
Price $49.95
Reviewed by Anna Prussing

Following on from Suzanne Verrier's earlier study of Rugosa roses, this second volume presents an exhaustive study of the Gallica family. The author's passion for these old treasures is implicit throughout, and the lyrical descriptions of colour, scent, shape, and form in this genus leaves the reader reaching for an old rose catalogue to order more gallicas, or to begin a collection.

Gardeners facing the 21st century with the likely curtailment of home spray programmes and water supplies will be heartened to read Suzanne's knowledgeable work on the adaptability and survival qualities of these fragile looking beauties. She writes 'the stalwart Gallicas are genuinely healthy, disease free, hardy and accommodating plants, well suited for organic growing methods'. Unlike more modern rose types, they don't demand perfect soil, and will tolerate drought and even bloom in fairly shady spots.

Rosa Gallica includes a history of this rose, clear guides to cultivation, pruning and companion planting, covering over 200 gallicas known to be in cultivation.

These smaller growing roses are ideal for the smaller garden, and Suzanne's suggestions for combination with clematis and other vines to extend their season are intriguing.

To quote William Grant's foreword 'In the years to come, this book will be listed as an essential source of information about the gallicas... there is no doubt in my mind that this is the definitive work on this lovely rose and its descendants'.

Rosa Gallica is a must-have book for the lover of old roses, and the garden book reader with an interest in garden history.

All the books mentioned are available from Touchwood Books Mailorder, Box 610 Hastings ph. 06 874 2872, fax 06 874 2701 or from Touchwood Bookshop, 35 High Street, Auckland City ph. 09 379 2733. Remember RNZIH members get 10% discount.