New Zealand Garden Journal

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

Pratia physaloides

A Plantsman's Notebook • RNZIH News

Wellington's Duckpond - New Beginnings from the Past • A Sanctuary for Weeds

Sundials: Part One - Historical Background to Sundials

Volume one, number four, December 1996

PETER SKELLERUP

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NEW ZEALAND GARDEN JOURNAL

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Contents

Cover Picture : *Pratia physaloides.*
Photo : Rob Lucas.

A plant of streamsides and forest margins in the far north and the Three Kings and Poor Knights Islands. A very useful garden plant for shady areas with moisture retentive soils. The handsome leaves often cover the dark blue or violet flowers, which are followed by attractive purplish blue berries. Like many offshore island plants it is frost tender so is best grown under protection in colder parts of the country. One of those plants that has undergone several name changes in the past. Formerly known as *Colensoa physaloides*.

Plant and Garden News

Global List of Threatened Plants

The World Conservation Monitoring Centre in the UK has produced a global list of 33,730 threatened plants. This list includes the botanical name, the degree of threat, where the plant occurs and the data source. This is the first time such a list has been produced and whilst it is not complete, particularly for the tropical regions, it serves as a useful tool for identifying problem areas worldwide. It also draws attention to the plight of plants and the enormity of the problem. The list shows 395 species are extinct (not seen for 50 years in the wild). There are some predictions that if nothing is done, up to 60,000 plant species could become extinct in the next 30 years.

The World Conservation Monitoring Centre holds information on 110,000 plant species.

Disease Free Chestnuts

New Zealands's isolation has meant that we have been spared the ravages of many pests and diseases that could affect commercial crops . Whilst this is changing year by year with the accidental introduction of pests, many, such as the sweet chestnut (*Castanea sativa*) still benefit from the absence of debilitating pests and diseases. Chestnut blight has wiped out crops in America as well as in traditional chestnut producing countries in Europe. Gall wasp also contributes to lower yields. Neither of these are present in New Zealand.

The chestnut industry in New Zealand is in it early stages and one of the major problems that needs to be overcome is the variability of the current tree population. Scientists at the Ruakura Research Centre in conjunction with the New Zealand Chestnut Council are currently investigating the pollination requirements of New Zealand chestnut selections. Their aim is to develop trees that crop well and produce tasty nuts that are easy to peel and process.

From HortResearch Newsletter Winter 1996

Otari Management Plan Launched

Angela Griffin, Chief Executive of the Wellington City Council recently launched a revised management plan for Otari Native Botanic Garden, one of New Zealand's most important collections of native plants. This was the first major review of the management plan since Otari was established in 1926.

The plan took two years to complete and involved research into the development of Otari as well as development of future policies to guide Otari into the next century. The new plan provides a comprehensive history of the Garden as well as future policies. Some of the major changes that come out of the plan include:

- More intensive management of the forest remnant including pest and weed control. Also research into changes in the forest particularly the decline of podocarps.
- Development of new plant collections including a new rock garden, and an emphasis on collections of interest to the home gardener.
- Increasing role in plant conservation particularly the propagation and growing on of plants as part of integrated plant conservation strategies.
- Improved development of visitor facilities, and improved signage and interpretation.
- Establishment of a specialist advisory group.
- Promotion of Otari as a major tourist attraction, and centre for native plant horticulture.

Copies of the plan are available for $8 from Jay Davison, Reserves Policy Unit, Wellington City Council, Box 2199, Wellington

Garden News

Plant and Garden News

New Zealand Threatened Plants Poster

Manaaki Whenua Press have produced a full colour laminated poster with illustrations of some of New Zealand's threatened plants. It comes complete with notes on how to grow the plants in the home garden. The poster was illustrated by artist Sabrina Malcolm, and text written by botanist Dr Peter Johnson. The growing tips were prepared by Peter Heenan.

The poster costs $12 and is available from Manaaki Whenua Press, Box 40 Lincoln.

The White Spotted Tussock Moth

Aucklanders will probably have more knowledge of this pest than just about any other pest in their garden. The white spotted tussock moth has spurred the Government to carry out the largest pest eradication programme seen in many years. But what about the pest?

The moth has an unusual lifecycle, with the last generation of females of the season being flightless. This means they lay the eggs on the pupal case from which they emerge. These overwintering eggs hatch over a couple of months in spring. The spraying is timed to coincide with this hatching.

Feeding trials by the Forest Research Institute have shown that they are voracious feeders, and will eat a wide range of plants, particularly those in the Rosaceae family. They are also partial to *Nothofagus* and older larvae will eat *Pinus radiata*. This is particularly so when other food sources are eaten out.

It remains to be seen whether the control programme is successful. The sobering news from John Bain of FRI, however, is that 6 new tree pests have established in New Zealand in the last twelve months. The tussock moth is only the tip of the iceberg.

Gardening Trends

At the recent Institute Conference in Auckland, Jack Hobbs gave a fascinating address on current and future trends in gardening in the Auckland region. Many of these trends are also occuring in other parts of the country. Here are some of his findings:

- Natural species are making a comeback so smaller flowers are popular, for instance the new multiflora petunias.
- Hanging baskets are increasing in popularity.
- Designer plants such as palms, *Dracaena draco*, succulents, and even natives like *Scleranthus biflorus* are in demand.
- Garden centres are starting to offer more innovative, useful displays for the buying public. The new Palmers superstore, has sample plantings around the store showing how plants can be combined together.
- Use of larger plants for instant effect. Some nurseries cannot grow enough advanced grade plants to keep up with demand.
- Roses are one of the few plants to defy trends and are as popular now as ever. Still the number one seller in garden centres.

The Oldest Flower ?

Hot on the heels of the discovery of a living fossil in Australia, the Wollemi Pine, comes the discovery in Britain of the earliest flower yet known. This is, however, a fossil found by botanist Chris Hill. The fossil plant, christened *Bevhalsia pebja* is 130 million years old and may provide important clues between the flowering plants and a group of close relatives the gnetales. The 25cm plant has primitive fern like leaves and probably grew in boggy ground.

Pruning Roses the Easy Way

An article from a UK Consumer magazine makes fascinating reading for all those who worry about whether they have pruned their roses the right way and whether it will affect their performance. Trials were carried out several years ago in conjunction with the Royal National Rose Society at St Albans to compare traditional pruning methods with rough pruning

and going over roses with a hedge trimmer. Initial results were quite extraordinary: rough pruning, and pruning using a hedge trimmer produced more new growth than ordinary pruning. This growth was stronger and more vigorous. Floribundas produced more and better quality flowers using the new pruning methods.

There were some concerns that initial results wouldn't be sustained because of future problems of dense growth and dead and diseased branches in those two rough pruning methods. Results, two years later, however, showed that rough pruning and pruning using hedge trimmers still induced more growth, and better quality growth than traditional pruning. Floribunda blooms were again bigger and more numerous using these methods. There was no difference with hybrid tea blooms.

Pruning Research

Silverleaf (*Chondrostereum purpureum*) is one of the most common diseases on fruit trees, roses and cherries and can have devastating efects on commercial fruit production. Dr Adrian Spears of HortResearch has shown that it can cut productivity of apple trees by 50% and can drastically reduce storage life. Correct pruning procedures can lessen the likelyhood of infection. Here are some tips:

- Ensure live tissue surrounds wounds where pruning cuts are made. This ensures doughnut type callus is produced.
- Do not leave stubs that will die back.
- Use the correct pruning tools. Sharp pruning saws are best on trees. Blunt loppers can squeeze and split wood.
- Always use a wound dressing on the same day cuts are made - allowing sufficient time for drying before dark.
- Never thin wound dressings with water.

Reminder - Horticulture Qualifications Transition

The Horticulture Industry Training Organisation (HITO) reminds those people who have received a horticulture training transition letter and have still not 'hooked on' to the new National Qualifications Framework (NQF) - **the final deadline for free credit transition is 31 December 1996.** After this date a fee may be charged for the credit transfer.

Transition is only available for those studying during 1993 or 1994 who didn't complete the following qualifications;

- any RNZIH qualification
- an apprenticship /trade certificate in horticulture
- a horticultural cadetship

You can formally register your transition letter by sending the $25 'hook on' form and fee to HITO, Box 8638, Christchurch.

A Plantsman's Notebook

by Derrick Rooney

Malus x *eleyi*

Thanks to an obsession with the past, traditional styles of planting featuring the perennials, roses, and shrubs of a century or more ago have reappeared in many gardens recently. Happily, one fashion from those expansive days has been left in limbo. This was the practice, in larger gardens or rural properties, of flanking long driveways with rows of purple trees: purple-leafed cherry plums, purple-leafed crabs, or, most ponderous of all, purple beeches. Now the practice is seen only occasionally in public parks or street plantings.

The erroneous assumption driving it was that "coloured" foliage must create a brighter landscape than plain green trees. The truth is that grouping these heavy masses of colour created an effect akin to that of a wedding without wine, or plum duff without sixpences: virtuous but boring.

This was not the fault of the purple-leafed trees, and they should not be written off. Used sparingly, and with the right companions, they can create excitement instead of stodge. My favourite example is a purple crab, bird-sown in a macrocarpa hedge that I pass often. The hedge is cut biennially, and between times the crab shoots away faster than the macrocarpa, putting out wand-like shoots smothered with rosy red flowers in mid-spring, and later with burgundy-coloured leaves, brightest when they are youngest. It isn't the crab that makes the excitement, it's the contrast between it and the heavy texture of the hedge.

That is how to get the best from purple trees in gardens. Use them as exclamation marks. Don't overuse them. And don't, for heaven's sake, plant a photinia anywhere near them.

Malus X *eleyi* and its subsets are the best-known of the purple crabs. Several cultivars are grown, and may be distinguished by their conical fruit. The closely related *M. aldenhamensis*, raised by a famous British gardener, the Hon Vicary Gibbs, is similar but has globular fruit. None is descended directly from the European wild apple, *M. pumila.*

Their ancestor is a Siberian tree, with the tongue-twisting name *Malus neidzwetzkana*, seldom seen now outside a few botanical collections, probably because no-one can pronounce the name. It is so heavily endowed with genes for purple that even its old bark is purple, and its young shoots are purple all the way through. The distinctive fruits, about 5cm long and conical, with a few deep, longitudinal grooves, are also purple all the way through. Some taxonomists regard the purple Siberian crab as only a subset of the European wild apple. The two cross readily, and most of the purple-leafed crabs of gardens were derived from these crosses. Some green-leafed cultivars also have a bit of the purple in them, revealed by their deep pink flowers or dark fruit.

Gardeners talk of these trees, both the green-leafed and purple-leafed kinds, as flowering crabs. Often it would be more accurate to call them "fruiting crabs", because some of the best cultivars were selected for fruit, not flowers. An example is 'Jack Humm', raised at Addington in the old Nairns Nursery, most of which is now buried beneath the Christchurch Southern Motorway. This tree's heavy crops of large, bright red fruit often hang late into the winter. Another New Zealand cultivar that I used to grow for its fruit is called 'Gorgeous'. A conical, erect tree, it has masses of white flowers in spring, and later ripens heavy crops of small, round, bright red fruit that made good jelly but indifferent wine.

More notable for flowers than fruit are 'Charlottae', derived from the North American *M. coronaria*, and *M. ioensis plena*, also North American. The former has large, soft pink flowers, sweetly scented of violets. The latter, raised at Bechtel's Nursery in Stanton, Illinois, about 1890, has very large, very double, pale pink flowers like little roses. It, too, is scented of violets.

More notable for their autumn colour are the Italian *M. florentina* and the Japanese *M. tschonoskii*. The former has small, lobed, hawthorn-like leaves and small white flowers that do not appear until early summer. It is charming both in flower and in autumn, when its foliage turns russet and flame before shedding. The latter has larger flowers, but they are relatively inconspicuous because the large, pointed leaves are well developed before the flowers appear. Most other crabs flower on bare branches.

I got a plant of Tschonoski's crab because someone who knows more about the crabs than I do recommended it for its space-saving, upright habit and for its autumn colour. It is certainly upright, because although it still has room to expand it is about four metres tall and no more than a metre wide.

About those purple beeches, sometimes called copper beeches: leave them to the people who plant public parks. Their effect is just too massive and heavy for all but the largest gardens.

Curiously, to my mind, some people actually like them. Maybe this is because colour is a mere pause on a continuum, but perception of it is highly subjective. For example, most gardeners, when confronted with dark red, itch to put something lighter, usually yellow, alongside it, and much of the time this is the right itch to have. Yellow is a natural companion for red. Sometimes, though, such a contrast is counter-productive. For real impact, try putting two fairly close colours alongside each other. That's what I did when I paired a dark red tree-peony species and a China rose.

The rose, 'Comtesse du Cayla', flowers off and on throughout the summer and autumn, and if there were no frosts would probably continue to flower through the winter. It is quite old, but not quite old enough to qualify as an antique; its first release for sale was in 1902. You can still buy it from several old-rose specialists, although you may have to wait a year for a plant.

If you think that a rose with a name like 'Comtesse du Cayla' must be French, you are right. The raiser was Pierre Guillot, a well-known rose breeder of the time. The colour was officially described as orange-red, but there isn't really a lot of orange in it, just the appearance of orange. The basic colour is pinkish red, fading to salmon-pink with age, and overlaid with a litany of coppery flushes.

The combination is one of the hottest you can find in old roses. The natural thing to do with it is to remove some of the heat by pairing it with a calmer rose, maybe 'Cecile Brunner', which is light pink, or 'Lady Hillingdon', whose flowers are like apricots dipped in mustard. This would certainly be in the best middle-class taste, but is it exciting? Well, no. I put *Paeonia delavayi* alongside the Countess, so that their colours could agitate each other. The peony flowers are deep red with just a hint of black. When this colour occurs in camellias or rhododendrons it is not a "garden" colour. It tends to get lost in the dark background. It is a colour for people who like to get very close to their plants. Here, the sharpness of the rose gave it just enough added zing to pull the head around from several paces away. A sensible colourist might have stopped there, to avoid overkill. I didn't. I added a touch of true vulgarity by planting the extraordinary rambling rose 'Veilchenblau' on a neighbouring trellis.

There is no such a thing as a blue rose, but 'Veilchenblau' comes close. It also has an interesting background. The parent, sometimes known as 'Turner's Crimson Rambler' and sometimes as the 'Engineer's Rose', has probably faded out of cultivation. It was a martyr to mildew. But 100 years ago it was famous as the first bright red climbing rose introduced to cultivation in British gardens.

A Scottish engineer, Robert Smith, sent it home to Edinburgh in the 1880s from Japan, but it was really a Chinese rose and had been cultivated, perhaps for centuries, under a name that translated as 'Ten Sisters'. Charles Turner, of Slough, a well-known rose grower of the time, travelled to Edinburgh to buy the plant, renamed it, and released it for sale in 1893. It had a sensational impact. Sales boomed. Queen Victoria reportedly travelled to Slough to see it flowering.

'Turner's Crimson Rambler' was superseded within a few years by the introduction of healthier and perpetual-flowering

red *Luciae* ramblers, but some of its offspring have survived. 'Veilchenblau', raised by a German breeder, J.C. Schmidt, is probably the best of them, and unlike some of the other ramblers is not too vigorous to be grown on its own roots in a small garden. The small, double flowers come in clusters on side shoots on stems one or two years old, so the only pruning required is to remove the oldest generation of stems every midsummer. Cut them right out at the base, to encourage strong new stems from dormant crown buds. The colour of 'Veilchenblau' is close to lavender but the hint of red in it turns the blue tones muddy in strong sunlight. To be seen at its best it needs afternoon shade, so I planted it on the south side of the trellis. Another splendid Schmidt rose, the white-eyed, pink 'Tausendschon', is on the other side of the trellis. These colours might seem a strange mixture, even in my garden, but there is no clash, or hardly any, because in four seasons out of five 'Veilchenblau' has shed most of its flowers before 'Tausendschon' is into full flowering.

Both these roses are pre-First World War, but like 'Comtesse du Cayla' do not qualify as antiques. 'Tausendschon' was first released in 1906, and 'Veilchenblau' in 1909. 'Tausendschon' later yielded a dwarf sport which was named 'Echo' and first marketed in 1914. 'Echo' in turn later produced numerous sports in red, pink, and salmon. These were given names like 'Brilliant Echo' and 'Smiles'. Dutch nurserymen used these sports in the 1920s and 1930s as the basis of a trade in container-grown roses, so you could say that in an indirect way these plants are relics of the very beginnings of the garden-centre revolution.

Almost everyone's idea of a clematis is the pink-flowered *Clematis montana*, which is pretty and prolific in spring, but in gardening terms is definitely a cliche. Few plants can match its efficiency in covering a tankstand or an untidy shed, but it flowers for only a fortnight or so, and turns brown in the lower reaches as soon as the weather gets hot and dry. The remaining leaves have little grace in their manner of dying in autumn. I grow its less vigorous semi-double form, 'Marjorie', which flowers for much longer and is an intriguing blend of cream and rosy pink, and a closely related species, perhaps a subspecies, *C. wilsonii*, which has white flowers, seductively scented of hot chocolate.

The later-flowering clematis are on the whole less vigorous and easier to manage (old man's beard and its close relatives excluded, of course), but have caused disappointments. The large-flowered kinds are supposed to repeat throughout the season, like a salad with too many radishes in it, but for me they tend to flower only once, and then not too freely.

Probably I am doing something wrong, because I have seen these plants performing spectacularly in other gardens. The big advantage in my treatment is ease of maintenance. Many people grow clematis on walls or trellises, which is about the most labour intensive and least sympathetic way to grow them. A better way is to plant them on the shady side of a tallish, twiggy shrub, and leave them to get on with life in their own way.

Young plants may need some fussing and feeding, and their stems may have to be trained or tied among the branches initially, but once they get the hang of it you can leave them to their own devices. Once a year, late in the winter, cut them down almost to ground level. The resultant vigorous shoots will have bigger and brighter flowers.

All the summer and autumn-flowering species and hybrids thrive on hard pruning in winter. The treatment is essential with super-vigorous climbers like the popular *C. orientalis*, whose small, lantern-shaped flowers look like bundles of orange peel, or the unique *C. rehderiana*, which flowers late and long, with small, straw-coloured bells, turned back at the ends and sweetly scented of cowslips.

Top marks in my notebook for flower power and ease of maintenance go to *Clematis viticella*, a southern European species that has been crossed with the large-flowered Asian clematis to make hardier large-flowered hybrids. British and European gardeners have cultivated this clematis since the 16th century. In its typical wild form the species has 4cm, bell-shaped purple flowers, and seedlings fairly close to this are likely to appear in gardens. 'Little Nell' is a cultivar fairly close to the wild form. Selected clones or hybrids include 'Ville de Lyon', with bigger, carmine-red flowers. Spring-flowering kinds like *C. montana* and its relatives shouldn't be treated like this. Pruning them in winter just cuts off a year's flowering. If you must prune these, do it in summer, as soon as the flowers fade away.

Institute

Office Changes

There have been a number changes at head office due to the reduction of staff during 1996. We have moved into smaller premises but in the same building on Farm Road at Lincoln University. The office is now only staffed on a Monday when Enid Reeves, the administration officer is working. Telephone and fax messages are cleared frequently. If you do need to get hold of anyone urgently please contact the Chairman of Executive, David Shillito at the contact address below. Note that both David Shillito and Ross Ferguson are available on E mail.

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Notable Trees Committee Box 28040, Wellington

1996 Conference and AGM, Unitec, Auckland

Almost 50 delegates atttended the 1996 conference and were treated to a stimulating 3 days of lectures and field trips. The venue at Unitec Institute of Technology was ideal, and the benign Auckland weather enabled us to fully explore some of Aucklands finest gardens and natural features.

The conference started on Friday afternoon with a stimulating address by Jack Hobbs on trends in gardening in the Auckland region. Other talks included the fascinating restoration of the Fernz Fernery in the Auckland Domain and the eradication programme for the white spotted tussock moth. The afternoon ended with an inspection of the wetlands at UNITEC, used to improve water quality of the

stream running through the campus and a trip to the Domain to view the Fernz Fernery. How good it was to see such a well thought out and tasteful restoration that will see the Fernery right for the next 50 years.

Saturday morning was given over to plant collections and was packed full of information and speakers. Unfortunately it ran over time but there were several highlights including Ross Ferguson's talk on germplasm collections and the role of the CRI'S. HortResearch has the largest collection of kiwifruit germplasm in the world.

The afternoon field trip to the Arataki Visitor Centre in the Waitakeres was of particular interest to me and highlighted the importance of good, easily accessible visitor information. We also fitted in 3 more talks, of particular interest being the revegetation of TiriTiri Matangi Island in the Hauraki Gulf. Neil Mitchell described how the project started and the major role played by volunteers. Results so far have been spectacular with several bird species being successfully introduced including Takahe.

On Saturday night, several of us chose to visit the Waipuna Motor Lodge to have dinner with the arborists. They have moved to form their own incorporated society and become a chapter of the International Society of Arboriculture. They successfully achieved chapter status at the conference and look set to go from strength to strength as a professional organisation.

As well as the conference session National Executive met on the Thursday and the AGM took place on the sunday morning. Highlights from these included:

- No change to National Executive. David Shillito re-elected as chairman.
- The NZ Open Garden Scheme will not continue. Competition from other schemes and the lack of a major sponsor have caused its demise.
- Members of NZAA will no longer automatically be members of the Institute, although they can join if they wish.
- Greater promotion needed for the PJ Skellerup Scholar ship to ensure it is awarded in 1997.

1996 RNZIH Awards

The 1996 RNZIH awards were presented at an awards ceremony at the annual Conference in Auckland in October.

Associate of Honour (AHRIH)

Awarded to a person who has given distinguished service to horticulture in New Zealand. Only 60 people can hold the award at any one time. Three awards were made.

Brian Buchanan of Auckland

To establish a new botanic garden is an act of faith - it also requires considerable investment and sustained hard work and effort. The Auckland Regional Botanic Gardens have made very rapid progress since they were opened in 1982 and this is in large part due to the excellent working combination of Phil Jew, the then Director of Parks, Auckland Regional Authority; Brian Buchanan, the Superintendent of the Gardens since they were established, and the skilled and enthusiastic gardening staff.

After his appointment as Superintendent in 1974, Brian Buchanan quickly demonstrated his ability to determine priorities, to develop procedures for getting on with the various tasks and projects in hand and to build up a team of staff who could assist with the initial and subsequent developments. In his own quiet way, Brian has, with much patience and personal commitment, led and guided the Botanic Gardens to their present success, acknowledged as fulfilling their mission of being "a regional centre for the display, study, conservation and enjoyment of plants".

In 1982, supporters of the Gardens decided to establish an organisation, the Friends of the Auckland Regional Botanic Gardens, which would act as a public champion of the Gardens. This organisation has been remarkably successful - probably best exemplified by the development of the Horticultural Library - and much of its success is due to Brian's efforts. He has encouraged the participation of the Friends in many Garden activities and he has coordinated volunteer help. At the 1996 Annual General Meeting, the Friends of the Auckland Regional Botanic Gardens elected him as an Honorary Life Member in recognition of his outstanding contributions to their Society, to the Auckland Botanic Gardens and to horticulture in general.

Brian is a longstanding member of the Royal New Zealand Institute of Horticulture, becoming involved in a variety of activities - Regional Meetings, Annual Conferences, garden judging and student tuition, teaching NDH students at night classes at Carrington Technical Institute, and he has served a term on National Executive.

Although Brian is a keen and knowledgeable plantsman with

an interest in a wide variety of plants, his particular and long-term passion has been for cacti and succulents. In 1980, he completed his National Diploma of Horticulture with a thesis on the propagation and cultivation of stapeliads. For many years he had a fine and meticulously curated collection of cacti and succulents. He became a member of the Cactus and Succulent Society of New Zealand , and has been editor of the Auckland and Hamilton newsletters for many years, a member of their National Executive since 1970, and National Treasurer and Membership Secretary for 20 years.

Footnote: Brian Buchanan was presented with his Associateship on the 3rd October by Joan Dingley, Dr Ross Ferguson, George Rainey and Joy Amos. He passed away a few days later.

Jack Hobbs of Auckland

John Gordon Hobbs or Jack Hobbs as he is known to all of us, has a love of plants, an expert knowledge of plants and the ability to write about those plants sharing his knowledge and enthusiasm. Today, more and more gardeners get their information from radio or television and are fortunate that Jack is equally adept at communicating through these media as he is through the printed word and photography.

He trained at Beaumont's Garden Centre, at the Ellerslie Racecourse Nursery and the Auckland Regional Botanic Gardens, receiving his National Certificate of Horticulture in 1980. The same year he was appointed foreman at the Auckland Botanic Gardens with special responsibility for developing the plant collections. In 1988 he was appointed Curator of Living Plant Collections, with responsibility for design of garden displays, plant acquisition, supervision of development and maintenance, plant evaluation, record keeping, preparation of interpretation programs, presentation of seminars and plant breeding.

He has become well known as a result of his writing and his involvement with television and radio. Since 1989 he has contributed regularly to *New Zealand Gardener*, with his articles usually concentrating on a particular genus with emphasis on the horticultural merits of available species and cultivars. They are almost always illustrated by his own excellent photographs.

In addition, Jack has written extensively for other publications such as *New Zealand Camellia Bulletin*, *Horticulture in New Zealand*, and *The Auckland Garden*, the newsletter of the Auckland Regional Botanic Gardens. He helped edit the manuscript of the late Hugh Redgrove, *A New Zealand handbook of bulbs and perennials*. In collaboration with Terry Hatch, he wrote *Bulbs for New Zealand gardeners and collectors* (Auckland: Godwit, 1994).

He is a regular speaker to conferences, horticultural societies and technical seminars but he is probably known to most people through his involvement with radio and television. Since February, 1992, he has conducted weekly garden session on Newstalk ZB, now broadcast to much of the country. More recently, he has become a television presenter. In 1993 and 1994 he appeared regularly on Living Earth (TV3) In 1995 he presented practical garden advice on the Palmers Garden Show, now Maggie's Garden Show.

Jack is also well known and respected as a plant breeder. His *Hebe* breeding program at the Auckland Regional Botanic Gardens has been especially successful with its aim of producing new cultivars of superior appearance and garden performance. *Hebe* cultivars released so far include 'Wiri Joy', 'Wiri Splash', 'Wiri Jewel', 'Wiri Spears', 'Wiri Grace', 'Wiri Image', 'Wiri Gem', 'Wiri Charm', 'Wiri Dawn', 'Wiri Vision', 'Wiri Mist', 'Anne' and 'Sandra'. The 'Wiri' series of hebes has been exported overseas and many thousands of plants are being propagated in Northern Europe. His *Leptospermum* breeding program has also been most successful with two of the best cultivars so far released being 'Wiri Joan', a tall shrub with bright red double flowers, and 'Wiri Amy', a semi-dwarf shrub with an abundance of pale pink flowers which have a deeper rose-red centre. In 1990 he was awarded the Institute's Plant Raisers' Award for the cultivars *Hebe* 'Wiri Splash' and 'Wiri Image' and *Leptospermum* 'Wiri Joan' and 'Wiri Amy'.

Many other plant improvement programs are also underway. In 1980 he started breeding dahlias in collaboration with Dr Keith Hammett. In addition, he is involved in selection programs with *Metrosideros*, using selections of wild material to produce hybrids showing garden excellence, *Agapanthus*, with the aim of producing compact hybrids of outstanding garden performance, *Leucadendron*, with hybrids produced being grown for commercial flower production, *Penstemon*, and *Polyanthus* with the aim of introducing many of the desirable features of the 'Cowichian' strains.

According to Jack Hobbs, 'Gardening is the ultimate art form.' Jack is a successful gardener and his garden was judged of sufficient quality to be included in the 1993 Trinity Garden Festival. There is no doubt, however, that he is more than a gardener: he has raised the standing of horticulture in New Zealand and by his writings and his television and radio broadcasts has brought horticultural knowledge and enjoyment to many thousands of New Zealanders.

Alan Livesey Mason of Feilding

Alan inherited his father Frank's love of horticulture and shortly after returning from the war he studied for a horticultural diploma and went to help his father on the family nursery. Shortly afterwards he started his own nursery and so began his love of roses. In 1947 Alan and his father assisted Professor Perrin of Massey University to set up Rose Trials. At the same time the firm started importing budding eyes of new cultivars from Harkness of England and, McGredy and Dickson of Ireland.

In 1974 Rose Introducers on New Zealand (RINZ) was formed and Alan was appointed treasurer a position he still holds.

Around 1947 he joined the National Rose Society and rose to become a National Judge. He has lectured to many groups

on roses and fuchsias and published the book Manual of Shrub and Old Roses. A revised edition will be published shortly. For many years he was a member of the National Executive of the Society. As a member of the Manawatu Rose Society he helped plan the Dougal McKenzie Memorial Rose Garden in Palmerston North, and in 1974, the start of the Rose Trial Grounds, the first in the southern hemisphere.

He has also been an active member of the Institute of Horticulture. He was elected to National Executive in 1971 and one of his major contributions was the investigation of plant patenting and the role the Institute could play. He also revised the RNZIH Salesmans Certificate.

He has also played a major role in civic affairs serving on the Feilding Borough Council from 1956-1962. In 1990 he was elecetd to the Manawatu District Council serving on the committees for Environment, Policy and Community: Keep Feilding Beautiful and Heritage Trails.

Fellow (FRIH)

Awarded to members who have made a significant contribution to horticulture and the Institute. Three awards were made.

Bee Baldwin of Wellington

Bee Baldwin has been involved in horticulture from an early age and has had a lifetimes involvement in journalism. In recent years she has written a very sucessful weekly gardening column in the Dominion and several gardening books including *Carry on Gardening*, *Growing Flowers for Pleasure and Profit*, *The Home Vegetable Garden*, and *Growing Gardens in Small Spaces*. She has been an Institute member for many years and has promoted the Institute through her gardening columns.

Barbara Hercus of Wellington

Barbara Hercus obtained her PhD in Botany at Sheffield in the UK and on her return to New Zealand she was employed by the Department of Agriculture working on the ecology of South Island tussock lands and the effects of burning snow tussock. She carried out pioneering work on the diet of sheep grazing on tussock.

Barbara joined the RNZIH in the 1970's and has recently become a member of the Branch Committee. She was a founder member of the Wellington/Kapiti Rhododendron Society, a member of the National Iris Society, and a committee member of the Friends of the Wellington Botanic Garden. She is a very accomplished photographer.

David Sole of Wellington

David Sole began his career in horticulture with the Wellington City Council where he advanced to the position of foreman of the street tree planting unit. In 1986 he left to establish his own business, Sole Gardening and Landscaping Ltd.

He has maintained an interest in education and been involved in the establishment of the New Zealand Landscape Guild and the development of an apprenticship in landscaping. He currently represents the landscape industries on the Horticultural Industry Training Organisation. He has also been an examiner for the RNZIH Oral and Practical Examinations.

Plant Raisers' Award

T J Mechen of Palmerston North

Mr Mechen has given a lifetime of service to the chrysanthemum: he is an enthusiast for all types of chrysanthemum, an amateur grower, a successful exhibitor, and an eminent chrysanthemum breeder. He has made outstanding contributions to the New Zealand National Chrysanthemum Society and his service was recognised by his appointment as a Life Member (one of only fourteen) and by being awarded the Ken Kitney Memorial Silver Medal in 1985 and 1989 for outstanding contributions to chrysanthemum culture in New Zealand.

Mr Mechen is the most successful breeder of chrysanthemums in New Zealand, and has been particularly successful in the breeding of anemone centred chrysanthemums. His cultivars in the "Mechen" and "Cloverlea" series have achieved great distinction both in New Zealand and internationally . In every New Zealand National Show since 1987, one of Mr Mechen's cultivars has been champion in the anemone centred classes and in only two of 66 shows have they been beaten. In the multi vase classes, for six, nine, or twelve vases, only three cultivars other than Mr Mechen's have been in the winning exhibits since 1991. He has also raised a number of very successful cultivars in other classes.

Mr Mechen has raised and named more than 40 chrysanthemum cultivars. We have nominated three of these for recognition by the Plant Raisers' Award:

'Dorothy Mechen' Anemone centred. 'Bridgette' X 'Claudette'. Raised in 1979. This was the first anemone centred chrysanthemum of his own breeding to be exhibited by Mr Mechen (1981). It is a wonderful parent and has also won many awards in its own right. In 1989 it won the United States National Chrysanthemum Society award, the Ernest Lyman Scott Award, given for the most outstanding introduction of the year.

'Edith Mechen' Anemone centred. 'Dorothy Mechen' X 'Claudette', raised 1981, first shown 1983. This is the all time winner cultivar of champion awards in New Zealand. From 1983 to 1995 it has won 18 National championships and between 1991 and 1995 it won at 19 local shows, and the Champion of Champions at the New Zealand National Chrysanthemum Society National Show in 1991. It is a good cultivar to grow, it is easily handled and has splendid pink flowers.

'Pop Hollows' Exhibition Incurved. 'Clare Houghton' X 'Yellow John Hughes', first shown 1993. It was the Champion of Champion at the New Zealand National Chrysanthemum Society National Show in 1995. it is also a vigorous plant with magnificent neat, tight blooms of yellow or light bronze.

Wellington's Duck Pond:

New Beginnings from the Past

by Stephen Dunn

Fig 1. Postcard showing an early view of the Duck Pond. D. Duthie Collection

There's a sense of history in the Main Garden of the Wellington Botanic Garden. For this is the oldest developed section on the 24.8 hectare site, with its formal garden beds, straight paths, ornamental fountain and listed mature trees.

In 1869, 13 acres of land beside Old Karori Road, now Glenmore Street, were the beginnings of the Botanic Garden. The mixture of garden design styles seen here today reflect the horticultural taste and fashions of the different periods of development.

With most of the original native bush removed, new plantings consisted mainly of conifers to cope with the exposed conditions. As the trees matured and attitudes changed to the dense stands of sombre evergreens, many trees were removed leaving a core of selected specimen trees that are historically important. The Edwardian penchant for growing exotic looking vegetation, such as agaves, cabbage trees, palms and Abyssinian bananas, are not apparent today. Follies and fencing of manuka stakes were festooned with climbing roses for gentlemen and ladies to stroll past and admire and the bandstand has gone too but the tradition of annual bedding schemes in formal beds survive.

The English style of clipped topiary and formal ornaments of the 1920's and 30's is well established in the framework of the garden . The Joy fountain with its statuary of cast 'Hinuera' stone compound is in a style derived from the classical tradition and European Art Deco period. These elements, together with hillsides of naturalised bulbs in the English Paradise tradition espoused by William Robinson, light standards recycled from old hotel verandah posts in the 1970's and an elegant summerhouse, all make a varied mixture of garden styles in the Main Garden.

Today the legacy of the past has been translated into the elements of the new Duck Pond development. The old ironwork, sandstone figures, park bench seats and other elements of previous styles have been repeated, but in different forms.

The Duck Pond, formerly known as the Frog Pond, Swan Pond, Lily Pond or The Lake, depending on what plant or

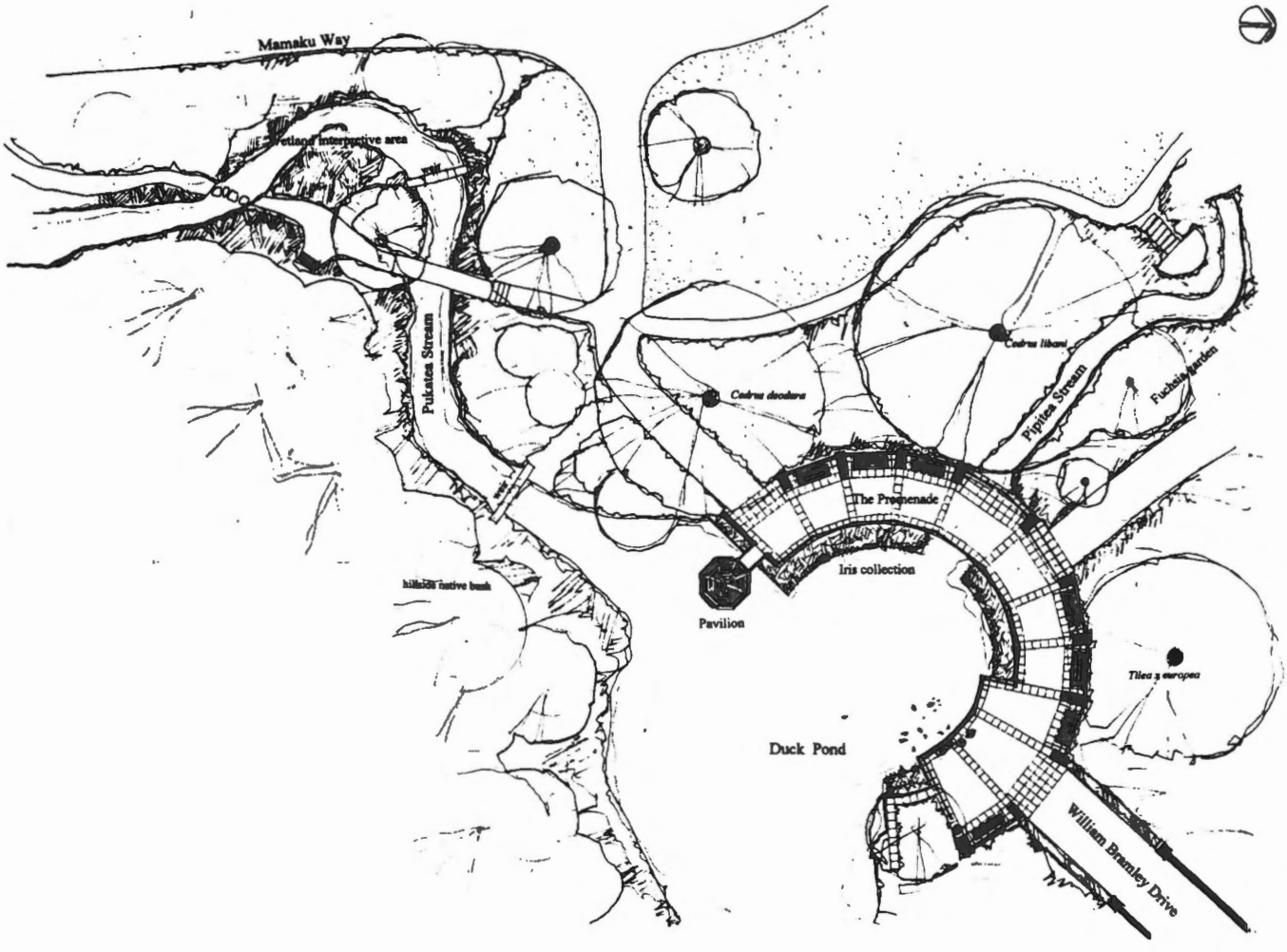

Fig 2. Plan showing redeveloped Duck Pond complete with formal promenade and Pavilion

animal life frequented the water at the time, was originally a wetland at the confluence of the Pipitea and Pukatea Streams, fenced off with barbed wire. The pond once also featured an island of pongas and an ornamental fountain but after a weir was built the area became an open area of water fringed with a variety of plant types without a sense of place.

The winning design submitted by Boffa Miskell Ltd in the 1994 competition run by the Wellington City Council and Friends of the Botanic Garden, identified a number of issues that the area lacked; a poor spatial organisation, no botanical or horticultural theme and poor relationship with the water. Overall there was no design or visual cohesion and the area lacked a sense of place or occasion.

Many visitors, particularly family groups, use William Bramley Drive as a main route from the Entrance Gates to the Duck Pond, feed the ducks then walk on to the playground. On reaching the pond overshadowed by two large macrocarpa trees, the Drive made an abrupt stop signalling it was time to hoist children above the stark white netting fence to view and feed the wildlife in the pond.

Today's design of the area recognises the need to give a sense of arrival and focus yet links with circulation routes to other areas of the Garden. A Pavilion with historic references to an earlier age provides the focus at the end of the Drive. A semicircular broad Promenade and retaining wall give a sense of enclosure; the formal shape wrapping around the enlarged pond with side paths leading to other areas of the Garden.

Even during summer the area has a cool feeling. In winter the moisture permeates everything and everyone. To give warmth to the area even during winter months, the retaining wall constructed of stout pillars with recessed panels and rebated wall sections has a warm yellow plaster finish. This is a reference to the nearby Joy fountain with its sandstone compound figures and details. The paving too, of finely exposed aggregate has a mixture of dolomite chips and white cement to visually give the area some warmth. Panels of exposed aggregate paving with a pattern of 'spokes' extending from the wall columns out to the pond edge create a strong design element; leading the eye to the waters edge.

Seats have cast iron supports of castings made from an

Fig 3. Duck Pond before development

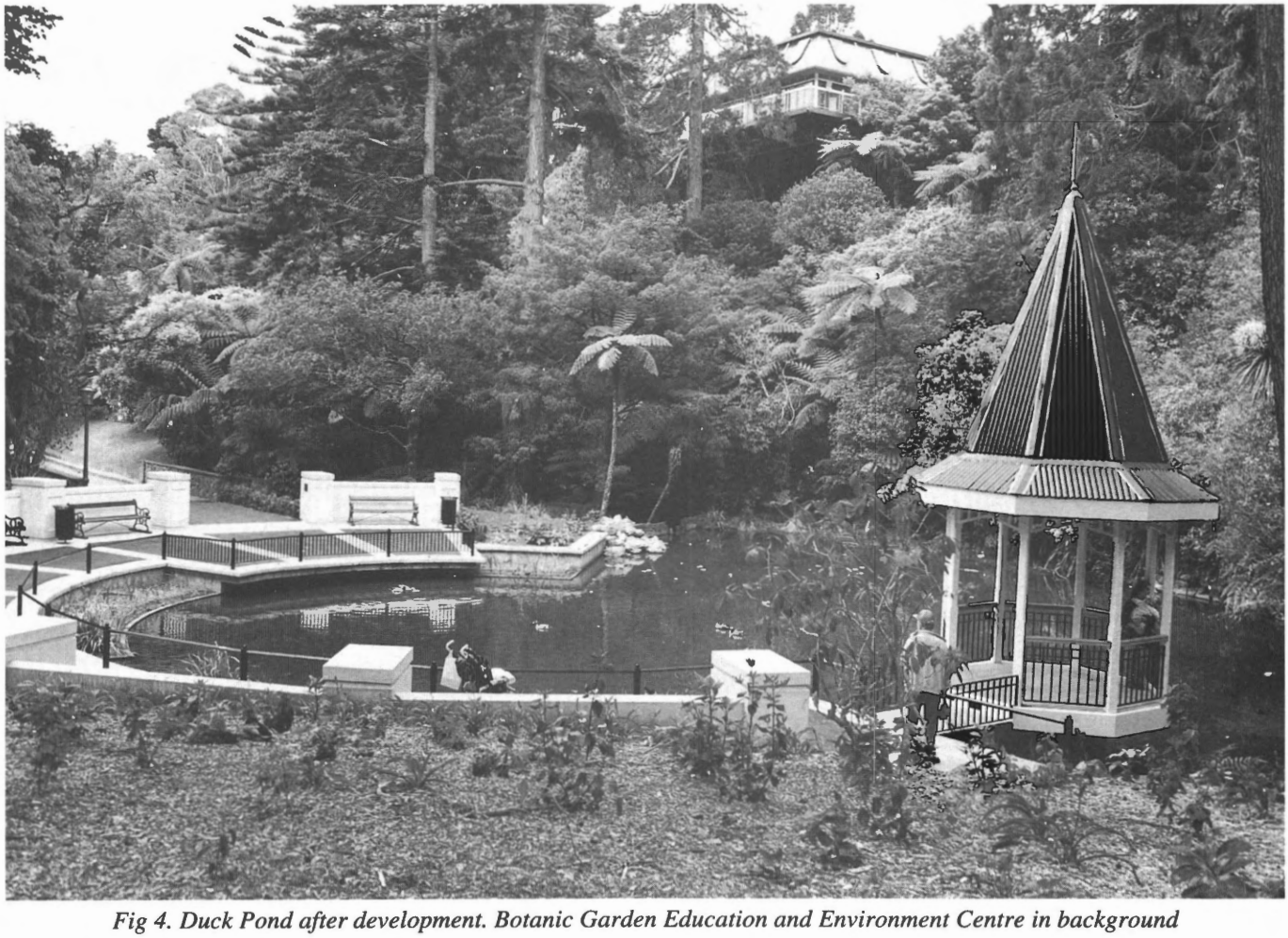

Fig 4. Duck Pond after development. Botanic Garden Education and Environment Centre in background

original Botanic Garden seat design. New litter bins of a traditional style were selected to complement this historic feature and link with those used elsewhere in the Garden.

Ironwork that surrounds the Main Garden and forms the Founders Entrance gates were the cue for balustrades and low railing around the Duck Pond. During development of the design, a public consultation process undertaken with an independent facilitator identified the need for a low rail around the pond edge to prevent under two year old children falling into the water.

Cantilevered paving extends out over the water in one section. It is here the business of feeding the ducks is done and a low balustrade with panels to paving level is provided to give full safety. Elsewhere a low rail beside the waterside plants defines the pond edge, linking to the Pavilion where a full height balustrade again provides a safe feeding spot over the water. To ensure the low rails were primarily used as a barrier and not a play element a steel square hollow section has been used to deter children swinging on it. The design of rail and posts capped with balls are reminiscent of older type barriers which were once used to keep people off lawns or garden beds in an earlier age.

The design concept included creating habitats for horticultural collections and interpretive areas and special attention has been given to this. Whereas Pukatea Stream once flowed unimpeded into the pond, today two low weirs give life to the area by the sound of falling water and create miniature ponds for native wetland plants. Wetland edges along the ponds have been planted with *Carex secta, Leptocarpus similis, Baumea rubiginosa* and other sedges, *Cordyline australis, Cortaderia fulvida, Dacrycarpus dacrydioides* and other plant species associated with marginal ecosystems. The interpretation of this area that represents a natural system is also an outdoor extension for the environmental education classes held by World Wide Fund for Nature NZ housed in the 'Treehouse' that overlooks the pond.

Around the edges of the pond, water plants specifically for horticultural display are planted. Japanese and Louisiana iris have been planted here in the submerged planter beds beside the Promenade.

In the background beds, collections of different species are accommodated. A collection of *Fuchsia* species is being established on the banks of Pipitea Stream. *Viburnum* species and varieties create an enclosing backdrop to the whole development while *Hosta* spp., *Helleborus* spp. and *Liriope muscarii* in shady areas give visitor interest. Behind the Promenade wall *Chimonanthus praecox* and *Viburnum* varieties are also planted for fragrance. Up Pukatea Stream the native wetland plants available for visitor interpretation also give an informal introduction to the tree ferns and original native bush further upstream.

To educate and inform the public, interpretative panels are being prepared and will be located in the main planting zones.

The project management by Russell Drysdale & Thomas ensured a quality finish by establishing contract packages for the various construction trades. The highest winter rainfall readings during the construction process tested the building contractor's resolve as water flows rose and fell dramatically over short periods while stumps and roots of the two large macrocarpas which had earlier been cut down, were tenacious and reluctant to leave the site.

The project also presented some interesting challenges when dealing with the resident wildlife. Once the streams were dammed and diverted through pipes and a large plug pulled out of the main weir to drain the pond, the ducks migrated to a nearby lawn behind the construction fence. The lure of food thrown by visitors standing outside this perimeter fence was an added incentive to get away from the noise and debris generated by construction works. As if to get their own back in being pushed away from their pond, the ducks forced beaks under newly laid turf and created depressions in it to paddle and feed. Their potential to damage waterside plantings prompted the placement of reinforcing mesh cages over the irises until planting becomes established. How successful this measure is remains to be seen.

It was the foresight of Wellington City Council and the Friends of the Botanic Garden that prompted this development using funds from the Charles Plimmer Bequest and the Friends own resources. The new development has created a sense of place. A place for all to enjoy and a legacy for future generations.

Stephen Dunn is a Fellow of the New Zealand Institute of Landscape Architects and senior landscape architect with Boffa Miskell Ltd, Wellington. He specialises in landscape design and was involved in the competition stage as well as being the project landscape architect for the Duck Pond development.

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Boffa Miskell Ltd	Principal Consultant
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Jackie Gurden	Facilitator
Walter Cook	Historical Advisor
K C Property Services Ltd	Civil Works Contractor
Contour Asphalts	Asphalt Contractor
Sole Gardening & Landscaping	Landscape Contractor
Betteridge Engineering	Metalwork Contractor
Arnold Murphy	Solid Plaster Contractor
Capital Construction	Pavilion Contractor
WCC Botanic Garden	Planting Contractor
Wellington Concrete Products	Paving Supplier
Kenneth Croskery Ltd	Litterbin Supplier

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The Botanic Garden, Wellington Winsome Shepherd & Walter Cook

Wellington Botanic Garden Wellington City Council Management Plan

Sundials

This is the first in a series of three articles in which John Ward and Margaret Folkard explore the history, use, and range of sundials available today. The articles are based on their book, Sundials Australia, the second edition was published in 1996.

Part 1 Historical background to sundials

Most of us know of a garden containing an old sundial tucked away in a corner, surrounded by flowers, quietly telling the time. Sundials in one form or another have been used by different societies for more than 5,000 years. The Greek historian Herodotus (484-425 BC) stated in his writings that sundials originated with the ancient Chaldeans and Sumerians who lived in Babylonia between the Tigris and Euphrates rivers in the region formerly called Mesopotamia and now known as Iraq (Gibbs 1976). They used vertical rods on their buildings as shadow casting devices for telling the time and date, and were the first people to divide the day into 24 hours, the week into 7 days, and the year into twelve months (after first having divided the sky into the 12 signs of the zodiac.)

From these beginnings, methods for designing and constructing various types of sundial have been developed by many different cultures right through to the present day. Many articles have been written about the history of sundials. However, a large number of them use uncertain sources and are somewhat contradictory. Readers who are interested in pursuing in detail the fascinating study of sundials from the beginning of mankind's recorded history will find the following references helpful (Gatty 1900, Newton and Mayall 1938, Hogben 1946, , Winthrop 1975, Gibbs 1976, Wilson 1980, Rohr 1982, Apel and Pytel 1990)

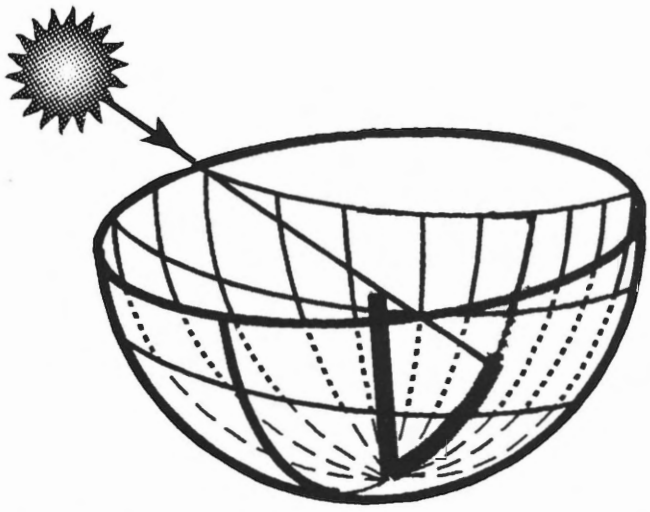

Fig 1. Schematic hemisphericum - the grey curve represents the post's shadow

The Greeks and Romans in particular created a great variety of sundial types and used them throughout their far-flung empires (Gibbs 1976). In the following paragraphs we give a brief outline of some of the most important events connected with time keeping in that part of the world,

Anaximander of Miletus is believed to have introduced the first knowledge of sundials to Greece during the 6th century BC. The Greeks had many public sundials consisting of tall columns casting shadows onto the ground, and many citizens had their own sundials. Aristophanes' play 'The Frogs' written in 405 BC (Tucker 1906) contains the line "When the shadow is ten steps long, come to dinner"

About 340BC Berosus, a Chaldean astronomer-priest living in Egypt during the time of Alexander the Great, developed the hemisphericum, in which a vertical post was placed centrally inside a hollowed out hemisphere. The inside surface of the hemisphere had vertical lines carved on it to divide the daylight period into 12 hours, and horizontal lines to show the seasons. The shadow cast on the inside surface of the post marked out the path of the sun as it travelled across the sky.

From this developed the hemicyclium, shown in Figure 2, which was widely used throughout the civilised world right up until the 14th century.

About 100BC the Tower of the Winds (De Solla Price 1967, Aked 1992, Aked 1993, De Solla Price and Noble 1968, and Figure 3) was erected in Athens at the foot of the North Slope of the Acropolis. This is an octagonal tower whose walls face towards the 8 cardinal directions North, South, East, West, North-East, North-West, South East and South-West. It is so named because each wall features a carving with allegorical repersentations of the wind which blows from that particular direction, together with its name. Although it was primarily designed to contain a Clepsydra (waterclock), a large sundial with a horizontal rod gnomon was carved into each wall. The angle of the shadow on each sundial told the time, while the length of the shadows told the date, so the building acted as both clock and calendar. The Tower is accurately aligned North-South, so the sundial markings on the complementary faces (eg NE and NW) are repeated as mirror images. The carved lines of the sundials were reported as being very faint some 60 years ago, but today they are almost indistinguishable due to the ravages of pollution and acid rain. After all this time, it is not surprising that the gnomons are missing.

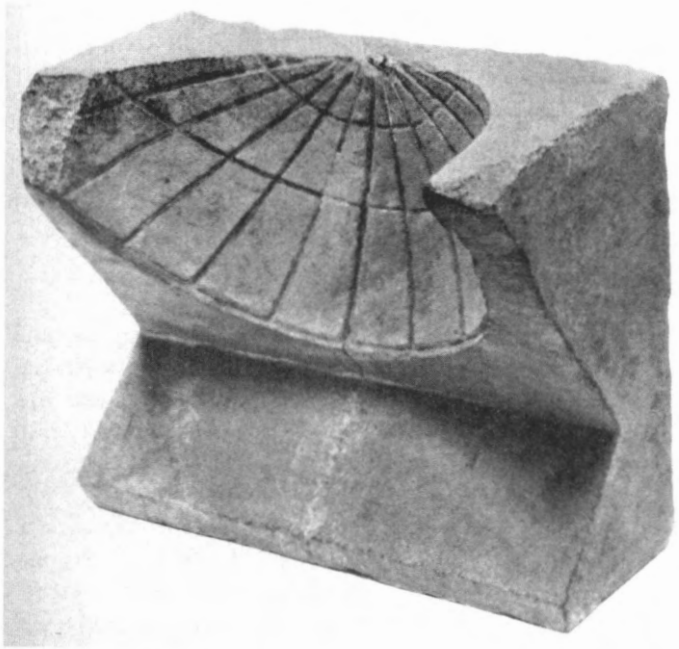

Fig 2. Hemcyclium now in the British Museum - as with most hemicycliums found in modern times, the shadow casting gnomon rod is missing. (The gnomon would have been a horizontal rod attached to the top of the hemicyclium where all the hour lines meet)

In the following centuries the Greeks developed the sundial further, and experimented with hemicycles, conical dials, cylindrical dials and flat dials set at various angles. In those days, a system of unequal or temporary hours was in common use, with the available period of daylight divided into 12 parts - resulting in 12 long daylight hours in summmertime and 12 short daylight hours in wintertime. Astronomers, however, used 'equal' hours (just as we do today) for charting the moving heavens.

The Romans are not believed to have developed any new sundial types, but they certainly used all the Greek sundial developments, and sundials were extremely popular throughout their empire. Surviving specimens of Roman portable sundials have been found designed for latitudes from Britain through Narbonne in France to Ethiopia and Mauritius.

The playright and poet Titus Maccius Plautus (250-185 BC) produced the following verse which demonstrates just how common sundials had become in Rome during his lifetime (The English translation given here is taken from Mayal and Mayal 1973)

"The gods confound the man who first found out
How to distinguish hours! Confound him, too,
Who in this place set up a sun-dial,
To cut and hack my days so wretchedly
Into small portions. When I was a boy
My belly was my sun-dial; one more sure,
Truer, and more exact than any of them.
This dial told me when 'twas proper time
To go to dinner, when I had aught to eat.
But now-a-days, why, even when I have,
I can't fall-to, unless the sun give leave.
The town's so full of these confounded dials,
The greatest part of its inhabitants,
Shrunk up with hunger, creep along the streets."

The Roman architect, engineer and writer Vitruvius men-

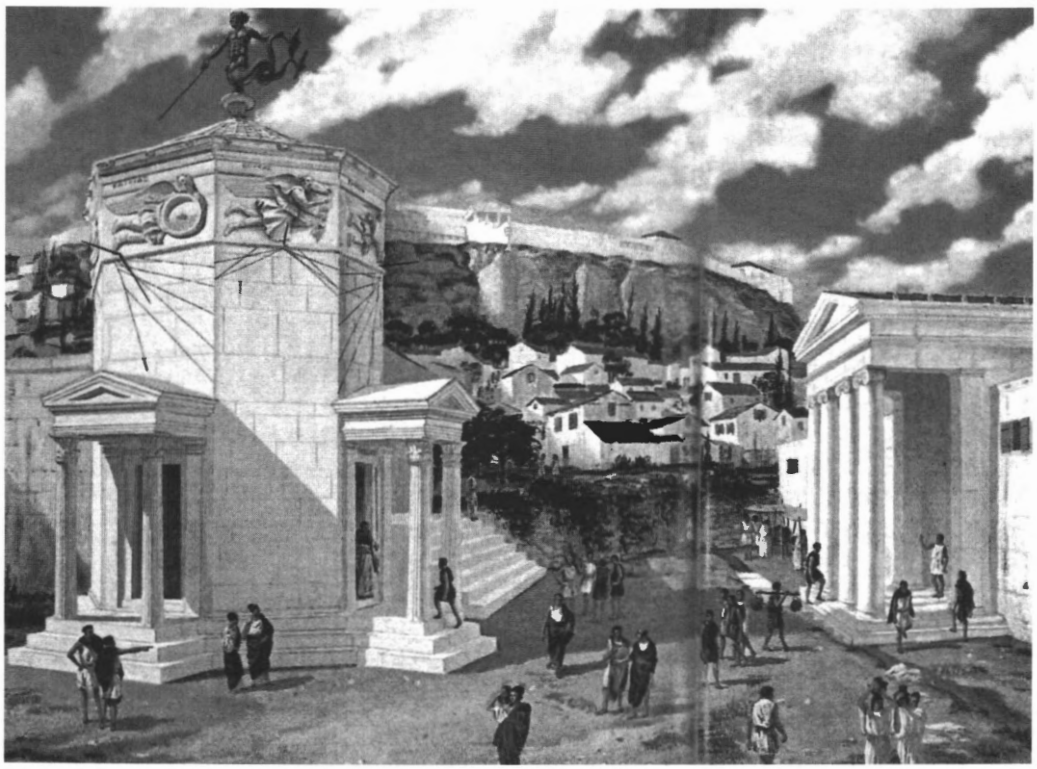

Fig 3. Tower of the winds, Athens (from a drawing in De Solla Price 1967).

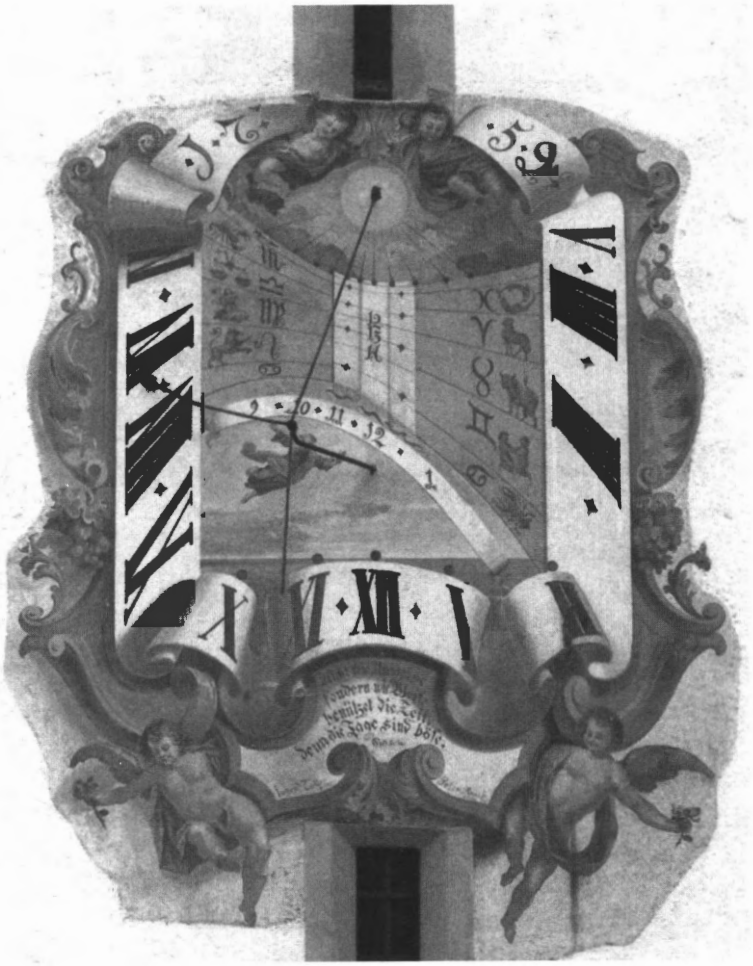

Fig 4. Elaborate sundial on the tower of Natters Church in Austria. This was designed by Peter Anich in 1759 and has been continually 'refreshed' over the years, as it is considered to be a national treasure

tioned 13 kinds of sundials including portable types, in the 9th volume of his work on architecture 'De Architectura Libri Decem'. This treatise, containing two chapters dealing with gnomonics was published in 27 AD but was later lost, and only rediscovered in 1486 (Granger 1931-1934). One of the sundials discussed by Vitruvius was the pelekinon, the type built by the Emperor Augustus in Rome in 9 BC which covered a vast floor area of 180m x 110m and used a 30m tall obelisk from Heliopolis in Egypt as its vertical gnomon. This particular sundial will be discussed in a later article.

In 150 AD Ptolemy of Alexandria (Ptolemaeus 1984, Peters and Knobel 1915) produced a book entitled 'He Mathematike Syntaxis ('The Mathematical Collection') which 9th century Arabic astronomers renamed the Almagest or 'Greatest Work'. In this work Ptolemy set forth his theory that the earth is stationary and at the centre of the universe, and that the Sun and the Moon and all the planets revolve around it. He also showed how to draw the hour lines of a sundial by projection and invented the analemma. His book was fortunate to survive the tragic burning of the great library at Alexandria in the mid 7th century AD.

Although the Greek Aristarchus had suggested 400 years before Ptolemy that the Earth and other planets circle the Sun (Anon 1986), the Ptolemaic Earth-centred theory was taken virtually as an article of faith right up until the 16th century when it was replaced by the Copernican Sun-centred system (Copernicus 1976). However, the Earth-centred concept is still perfectly satisfactory for describing and designing sundials, so we are probably the only members of the human race still sticking to Ptolemaic principles!

One of the many controversial dates in gnomonic history relates to when the gnomon of a sundial ceased being either vertical or horizontal, and was first inclined at the latitude angle to make it parallel to the axis of rotation of the Earth. Only when this happened could sundials tell time according to the system of equal hours. By the 14th century this method of constructing sundials had become common in Europe, and at about the same period mechanical clocks which divided the day into 24 equal hours started to appear. The early clocks were rare and very expensive, and not terribly accurate. They were often wrong by several hours and were frequently calibrated using sundials. Some mediaeval towns became famous because of their sundials - one example is Rothenburg ob der Tauber in Germany which still has many splendid sundials that were made long ago.

In addition to telling the time using lines and numbers marked on a dial plate, sundials needed to have human appeal. Fine craftsmen developed high levels of artistic skill and decorated their sundials with embellishments of every kind. This artistic decoration, or 'furniture' as it is called, required many hours of labour to be carried out on both the dial plate and the gnomon (the part which casts the shadow). Many of these old sundials are now family heirlooms and very costly antiques which only museums and the like can afford to buy. As a direct consequence of the design difficulties and the labour required to produce a sundial, most people were unable to afford the high cost of such instruments. Consequently the owners of these enduring sundials throughout history have been the wealthy and public institutions such as cathedrals, parks and town halls. Figures 4 and 5 illustrate typical elaborate and consequently expensive sundials.

Countless sundials have been designed and made in every conceivable shape, size and form. The most commonly used materials for these sundials were copper, brass, bronze and stone, materials chosen mainly because of their ability to resist corrosion and because skilled craftsmen could work in these materials using traditional techniques. The time-telling hour lines marked on these old sundials were carefully placed in position using intricate graphical construction techniques which were based on sound geometric theory developed over many centuries. Hundreds of ancient sundial books abound which describe in confusing detail how to 'lay-out' or draw a sundial. These geometrical methods are complicated, tedious and very time consuming. Fortunately such methods can now

Fig 5. Model of the Equatorial Sundial in the grounds of the National Maritime Museum at Greenwich, England. The bright patch of light passing between the dolphins' tails indicates the date and time. Produced in 1977 to celebrate the Silver Jubilee of Queen Elizabeth 2.

be totally discarded. The ready availability of computers and pocket calculators allows even complicated sundials to be accurately designed using simple mathematical equations derived from the basic principles of spherical trigonometry. (The formulae that allow you to do this yourself will be given in a future article).

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A Sanctuary for Weeds

by Alan Esler and Leslie Haines

Fig 1.

Waikumete Cemetery had its beginnings in 1886 when Auckland had to look outside its boundaries to Glen Eden for burial sites. Waikumete was a 180 acre hill covered in gumland scrub and pitted with holes left by casual gum diggers. Garden plants escaping from the graves were unhindered in winter when the ground was too soggy to be tended. This favoured plants which passed most of their life cycle at that time of year. They were mostly species that evolved in South Africa. Those from the SW Cape lived in a Mediterranean type climate with mild, wet winters and hot dry summers spent in the dormant state. They thrived at Waikumete in spite of a mean annual temperature 3°C lower and 5 times as much summer rain as they would receive in their natural habitat.

From August to December the old part of the cemetery is aglow with SW Cape flowers. First to flower is freesia then *Sparaxis bulbifera, S. tricolor* and babiana. Soon after come *Ixia maculata* and *I. polystachya* followed by *Tritonia crocata* and watsonia. Early in November there is a magnificent show of a *Romulea* sp. In December most of the colour is provided by long-flowering watsonias and *Ixia polystachya*. All the while *Oxalis purpurea* produces a succession of flowers near the ground. *Aristea ecklonii* and *Tritonia lineata* from the eastern Cape make a contribution.

Babiana stricta grows in drained to wettish places in the cemetery. Its home habitat is coastal dunes and other open places. In 1972 when we noted it first as a wild plant there was very little of it, and only in the common colour form. Now it is widespread in the cemetery in the full range of colours. Flowers Aug - Dec.

Freesia refracta heralds the spring with its cream flowers and delightful scent. Free draining places suit it best. At the Cape it grows in well drained stones, clay, shale and limestone among bushes in full sun. Flowers Aug - Oct, the later flowers being in shaded places.

Hypoxis capensis tolerated wet winter soils at the Cape, and the one colony known to us grows in such a place which it shares with *Narcissus bulbicodium*. Flowers Sept - Oct.

Ixia grows in many variants within at least 2 species mainly on raised burial rows . *I. maculata* comes from flats and lower slopes with well drained humus-rich soil in full sun, *I. polystachya* from mountain slopes and flats on well drained, poor acid soils in partial shade. *I. maculata* flowers Sept- Oct, *I. polystachya* Sept - Dec and puts on a prolonged display in spite of a prevalent disease affecting the leaves. *I. paniculata* was seen quite frequently up till the last few years.

Oxalis purpurea comes from the coastal regions with well

Fig 2.

drained heavy soil in full sun. In the cemetery it grows also in wet soils and light shade. Flowers April - Dec in 2 colour forms.

Romulea sp. has not yet been identified by us. It has large spectacular orchid purple flowers on drained soil in November and early December. It was first seen in the cemetery in 1984 and is now widespread there.

Sparaxis bulbifera is an extremely versatile species growing in the wettest to the driest places in sun or shade. In its natural habitat it grows in sunny places in sand, clay, wet or dry soils and tolerates waterlogging in winter and hard soils in summer. Flowers Sept - Oct, most flowers being white but there is a good colour range. The natural habitat of *S. tricolor* is semi-karoo scrub but soil details are unknown to us. In the cemetery it grows in places that are neither very wet nor very dry. It is not numerous any more but there is a good range of colours in Sept - Oct.

Tritonia crocata comes from clay soils on flats and slopes. It grows on drained cemetery soils in diminishing numbers. Flowers are mainly orange. Other colour forms may have now disappeared. Flowers Oct - Nov.

Watsonia grows mostly where there is good to moderate drainage. For some unexplained reason flowering is most prolific on the margins of concrete graves. Elsewhere the plants are mostly stunted and flowerless, sometimes over large areas. There appear to be at least 2 species from our preliminary look - *W. borbonica* one form represented by large white flowered *ardernei* and *W. meriana* by the bulbillifera polyploid sport and others. *W. borbonica* at the Cape grows on rocky, well drained slopes. *W. meriana* is from seasonally wet flats, temporary ponds, stream banks on sand and thin rocky soils on sandstone and granite in full sun. It extends into the E Cape region and Natal but the sport was originally quite localised . The bulbil watsonia is very distinct with its sparse fire red flowers and aerial bulbils (more correctly small corms). These develop in flower bracts and about 5 leaf axils with up to about 100 per stem. These fall when fully developed and establish quickly without facing the same hazards as seedlings do. In 1972 we saw a few in the Jewish section, now bulbil watsonia is almost throughout the old part of the cemetery usually replacing all other plants and obscuring graves.

This is only part of the story. The plants that we like to call wildflowers because they are herbaceous, good looking and wide ranging come from many countries and represent many plant families and many kinds of vegetation. (We accept that to some people they are weeds). Plants from the Mediterranean and adjoining parts of Europe are part of the scene. Early in the winter before the African plants bloom *Narcissus* of various kinds are in flower, also snowflake in abundance. Then comes the despised onion weed contributing massively to the *Sparaxis* display, occasional *Scilla peruviana* and more rarely a pink *Allium*. After the flush of African plants the place is enlivened again by *Centranthus rubra* and *Linaria purpurea* on the graves and elsewhere vast numbers of oxeye daisy and wild carrot. This weedy vegetation is reminiscent of roadsides and the poor pastures of Britain and Europe. There is a full range of other meadow plants, the kinds we used to see on roadsides before they became overgrown with kikuyu grass and other aggressors. So the cemetery preserves representa-

Fig 3.

tives of this kind of vegetation as well as the unparalleled wild collection of African garden escapes, and many relic species from the gumlands - orchids, sundews and sedges now in diminishing numbers.

Another set of aliens have a different role. They are some of the cemetery weeds that accompany bulbil watsonia. Among the 25 we listed are agapanthus, pampas grass, Phoenix palm and Spanish heath. In this group are plants from Argentina, Brazil, Australia, Europe, Canary islands, California, China, Japan, Himalayas, Kenya and South Africa. Each one of them was brought to New Zealand for a purpose and disgraced itself by overwhelming graves or by splitting graves apart as their roots expanded in cracks and joints in the concrete.

Within the designated one hectare wildflower sanctuary the main focus is on perpetuating the colourful herbaceous garden escapes by suppressing competing growth and trimming the spent growth in autumn.

Waikumete Cemetery has a prominent place in the annals of New Zealand botany. The Floras make frequent reference to it. When Dr Elizabeth Edgar was compiling Volume 3 of the Flora of New Zealand, a visit to Waikumete in 1972 opened up new horizons. Descriptions of many of the wild alien monocots were compiled from these cemetery plants with the assistance of the Auckland substation of Botany Division, DSIR.

We are grateful for help in finding details of natural habitats of African plants given by Steve Benham (Auckland Regional Botanic Garden), Ewen Cameron (Auckland Museum) and Julie Fowlie (Touchwood Books). The West Auckland Branch of the Royal Forest and Bird Protection Society helped us to persuade Waitakere City Council that Waikumete Cemetery is something more than a burial ground.

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

Book News and Reviews

Supported by Touchwood Books, specialist horticultural booksellers of Hawkes Bay

GREER'S GUIDEBOOK TO AVAILABLE RHODODENDRONS, SPECIES AND HYBRIDS

By Harold F Greer
3rd edition. Offshoot Publications. 1996.
Price $54.95 paperback, $89.95 hardback.

This 227 page book describes at least 750 Rhododendron species and hybrids with more than 450 being illustrated with colour photos.The book begins with a brief section on cultivation, propagation, pests and diseases, pruning and dead heading.

The main part of the book is an alphabetical dictionary with the name of the plant, approximate height at 10 years, hardiness, and a quality rating.

This quality rating is in three parts, out of five points for each part and covers the flower, the plant and its foliage, and the plants performance. Numbers go from 1 for the poorest to 5 for the best.

The plants flowering season is also given , plus, for the species. the country of origin and altitude.

THE SIBERIAN IRIS

by Currier McEwen
Timber Press 1996.
Price $89.95

This is the second book by Currier McEwen on Siberian Irises, the first being a fairly small paperback which went out of print several years ago. This new book is a 200 page hardback illustrated with line drawings and a section of 36 colour photos.

This monograph includes history, classification, description of the species, characteristics of modern cultivars, culture and pests and diseases.

The author, now 93 years old, has been growing and hybridising siberian irises for the last forty years and is an internationally recognised expert on the subject.

WATER GARDENING—WATER LILIES AND LOTUSES.

Perry D Slocum and Peter Robinson,
with Frances Perry.
Timber Press 1996
Price $129.95.

This is really two books in one, part one covering every aspect of water gardening from how to make pools, water features, bogs and waterfalls and the plants which can be used, except for water lilies and lotuses , which are dealt with in part two.

It is a collaboration between the English horticulturalist Peter Robinson, formerly of Stapeley Water Gardens, and the American Perry D Slocum, founder of Slocum Water Gardens, and a note worthy hybridiser of water lilies and lotuses.

Although she did not live to see its completion , Francis Perry started writing the book in 1986 and continued to provide guidance to the authors until her death in 1993.

The book is well illustrated with colour photos and black and white botanical line drawings. 320 pages, hardback.

THE COLLECTORS GARDEN. Designing with Extraordinary Plants.

By Ken Druse
Thames and Hudson
Price $99.95.

This book introduces 28 passionate American gardeners and collectors who are classified into four categories;there are the hunters, seeking out the new and the different; the missionaries driven to save threatened plants by growing them in conservancy collections; the specialists who focus on a taxonomic group of plants or a particular habitat. and the aesthetes, who collect plants for their appearance and value in garden design.

All the collectors share with the reader their different ideas and common passions. This 250 page hardback contains more than 400 photos taken by Druse, who is well known for his photography.

THE GARDENERS GUIDE TO GROWING HOSTAS.

by Diana Grenfell
Published by Florilegium Press 1996
Price $49 95

Reviewed by Penelope Bunny, Abbotsford Gardens and Nursery, Masterton

Hostas are highly prized for their clean sculptural leaves in an extraordinary range of colours. They have become one of the most popular of all foliage plants. Leaf colour varies from matt/blue - grey to glossy apple green with many shades and variations in between. Size varies from those with leaves as large as dinner plates to others no bigger than a thumb nail. There is a hosta for almost every shady/part shady situation and effect.

Of interest to me upon reading this book was Graham Stuart Thomas's comment in his foreword that " the genus Hosta is a comparative newcomer to the annals of horticulture ." As a

gardener I couldn't imagine working without hostas in my plans or viewing them in my garden. At the time of writing they are unfolding their loveliness for a new season. Their foliage effect is calming and the clumps are bigger and better every year. Slugs and snails are the only real harm and easily disposed of. In Diana Grenfell's book the history of hostas is informative, nomenclature and classification professional enough for those interested in serious hosta growing and collecting, and also straightforward enough for a keen gardener/small nursery proprietor like myself.

Cultivation notes are easy to follow and thorough. The only comment I would make is her recommendation that hostas with yellow foliage be given some direct sunlight. Here in the Wairarapa where I live I have to put yellow foliaged hosta in quite deep shade. They get sunburnt!

The suggestions about creating artificial shade as built at Applecourt (a nursery display garden of the genus hosta) and illustrated in the book, is an exciting option for those of us with little natural shade, but a yearning for those wonderful leaves now, not in ten years time when trees have grown! Hellebores could also be planted in this situation.

The book is punctuated with clear, effective, photographic illustrations. These cover ideas for using various cultivars, ideas for design and groupings and plates for easy identification purposes. A chapter on hostas in Australasia is contributed by well known, New Zealand plantsman and gardener Gordon Collier. The book is completed with a section titled "Selection of the Best Hosta List" in which hostas are divided into groups such as Flower Arrangement, Distinctive Leaves, Container Growing and Splashed Variegation groups.

I found the book very readable ,written by someone who really knows her topic ,well illustrated and a satisfying general information ,or reference read. It is a very useful book that helps gardeners like myself work through many of the new cultivars available. An A-Z of hostas in cultivation is included. A great informative read.

EARLY FRUITGROWING IN NEW ZEALAND

by Gerald Ward M.A.,
Published by the author, and available for
$32.95 from 42a Taylors Mistake Road, Christchurch 8
Reviewed by Charlie Challenger, Kereru,
Little River, Canterbury

Perhaps it is a symptom of New Zealand's increasing maturity, that recent years have seen a much greater awareness of the early development of horticulture in this country. In 1984, Helen Leach wrote "1000 years of gardening in New Zealand" and Thelma Strongman, "The Gardens of Canterbury" whilst in 1985 the R.N.Z.I.H. initiated a Garden History workshop. Under the sponsorship of the Historic Places Trust, Matthew Bradbury edited the more broad-based 'A History of the Garden in New Zealand'. However, the origins of more utilitarian aspects of horticulture as opposed to aesthetic, have been largely undocumented until now.

It is therefore a pleasure to welcome Gerald Ward's contribution, dealing specifically with the history of fruitgrowing in Canterbury. No-one could be more suited to the task, for he has been directly connected with the fruitgrowing industry as a grower for 26 years, acted as Dominion President of the NZ Fruitgrowers Federation for 4 years, and in 1983 was awarded a CBE for services to the industry. These wide connections have allowed him to draw upon an amazingly broad range of contacts, from the families of growers now long deceased, to scientists and academics concerned with the establishment of the industry.

Perhaps the limitations of coverage - Early Fruitgrowing in Canterbury - may deter those seeking broader fields. There is no need, for despite an understandable regional emphasis - Ward worked and lives in Canterbury - the wide picture is not ignored. Two chapters in particular, which deal with the roles of central government and the contribution of the evolving scientific research establishments make fascinating reading. There is a strong feeling of 'deja vu' when one compares recent government attitudes to those of the past. A scientist needs to be bloody minded as well as a good researcher to achieve his ends, and one admires for example the attainments of T.W. Kirk in the negative atmosphere of his time which Gerald Ward documents.

The bulk of the book is concerned with the fruitgrowers themselves, their struggles against climate, soil, pest and disease, limited knowledge and resources, economic conditions, market problems, and their "bootstraps tenacity at overcoming difficulties". As well as discussing specific regions favoured by growers, a few families, who are still active after the third or fourth generation are discussed in detail. We gain a keen insight into their self-reliant approach to earning a living. Today, we are so accustomed to back-up of all sorts, that it is difficult to visualise an industry where even such fundamentals as sprays and sprayers had to be "home-grown", or where advice on pest and disease control was non- existent. Yet at the same time, growers were experimenting with exporting crops to Britain - and at their own expense!

Communal effort was essential to their progress, through, for example, the Canterbury Fruitgrowers Association, founded in 1886. This helped growers directly, and in lobbying for Governmental assistance. Ward has documented all fruit growers throughout Canterbury from this era - roughly through to 1930 - and although I found a certain tediousness involved in the thoroughness of this coverage, the total resource of information is quite invaluable. As an example, he has collated all the fruit varieties - apples, pears, plums, peaches, nectarines and cherries, 11 pages in all - which were grown in Canterbury in these years, relating them back to their sources and the N.Z. nurserymen who grew them. A marvellous resource for some future research worker! Ward also draws parallels between the industries in New Zealand, Tasmania, America and Canada, and Britain, which show that despite our self-help approach we were far from being a poor relation. As an Englishman, who has worked in the apple orchards in Kent - one of the heartland areas of British fruitgrowing - I was most interested to appreciate the almost parallel advancement of the two areas.

This must not be the end of the road - we need more studies of similar depth, covering other fruitgrowing districts of New Zealand. From such accounts the essence can then be distilled, to provide a coherent account of the evolution of the valuable national resource which the New Zealand fruitgrowing industry now represents.