
HORTICULTURE IN NEW ZEALAND

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



Volume 4

Summer 1993

Number 1



HORTICULTURE IN NEW ZEALAND

JOURNAL OF THE ROYAL NEW ZEALAND INSTITUTE
OF HORTICULTURE (INC.)

Volume 4, Number 1 Summer 1993

CONTENTS

Executive Officer:

Rodger McCarthy
P.O. Box 12
Lincoln University,
Canterbury.

Communications concerning
membership subscriptions,
change of address and extra
copies of the Journal should be
made to the Executive Officer.

Editor:

Ronald M. Davison

ISSN 117-01803

All rights are reserved in
connection with articles
published in this journal and
where it is desired to
reproduce an article in any
form, permission should first
be sought from the
Executive Officer.

Views expressed in
Horticulture in New Zealand
are not necessarily those of the
Editor or of the Royal New
Zealand Institute of
Horticulture.

ARTICLES

- XCelmearia ruawahia* 'Nebulous' — A New Intergeneric, Collective Epithet
and Cultivar Name
Peter Heenan 2
-
- Stem and Branch: Patterns of Tree-Planting in Central Canterbury
since 1852. Part 1. The Banks Peninsula Area
Derrick Rooney 4
-
- Greening Wellington — The Roles and Responsibilities of Parks.
The Ian Galloway Memorial Lecture for 1992
Richard Nanson 7
-
- Book Reviews 11
-
- Hawkweeds (*Hieracium*)
Grant Hunter 12
-
- The Challenge of Plant Introduction
Dick Endt 13
-
- Re-documenting Your Garden's Lost Accessions
Scot Medbury 15
-
- Towards a National Garden Scheme
Neil Robertson 17
-
- New Zealand Plant Collection Register Update No. 3: 1 March 1993
Dr Keith Hammett 18
-

Front Cover Picture:

The striking leaf patterns of *Oreopanax*, an ornamental plant introduced from Ecuador
and growing at Oratia (see page 13).

Photograph D. J. W. Endt

XCelmearia ruawahia 'Nebulous' — A New Intergeneric, Collective Epithet and Cultivar Name

Peter Heenan

Landcare Research New Zealand,
Lincoln, New Zealand

Introduction

Intergeneric hybrids are recorded for the New Zealand flora in the families Asteraceae (Allan 1961; Clarkson 1988) and Apiaceae (Webb and Druce 1984). To date, only one New Zealand intergeneric hybrid has been given a formal botanical name. This is *XLeucoraoulia* Allan which is a collective name for *Leucogenes* X *Raoulia* (Allan 1939).

This paper provides an intergeneric, collective epithet and cultivar name for a shrubby, low-growing natural hybrid between *Celmisia gracilentia* and *Olearia arborescens* (Fig. 1). A full account of the discovery, natural habitat, and putative parentage of this hybrid is given by Clarkson (1988).

In New Zealand this hybrid has been in limited cultivation in several private

gardens, the DSIR Land Resources garden at Rotorua, the Botany Institute DSIR Land Resources experimental nursery at Lincoln, and in a specialist native plant nursery at Tauranga. As it is becoming more widely grown in New Zealand and is soon to be introduced to Britain, it is desirable to give this interesting and unusual intergeneric hybrid a formal botanical and cultivar name.

New Names

The following intergeneric name and collective epithet are published in accordance with the International Code of Botanical Nomenclature (Greuter et al. 1988) and the cultivar name in accordance with the International Code of Nomenclature for Cultivated Plants (Brickell et al. 1980). The descriptive statement for each epithet differs with rank and the requirements for valid publication.

XCelmearia Heenan

XCelmearia is the condensed formula for the intergeneric hybrid *Celmisia* Cass. X *Olearia* Moench. This name combines in alphabetical order the former part of *Celmisia* with the latter part of *Olearia*.

XCelmearia ruawahia Heenan

XCelmearia ruawahia is the collective epithet for *Celmisia gracilentia* Hook. f. X *Olearia arborescens* (Forst. f.) Cockayne et Laing. The epithet "ruawahia" takes the form of a noun in apposition, and refers to the summit of Mt. Tarawera, the original locality of this hybrid.

Diagnosis: Frutex ex hybridatione *Celmisiae gracilentae* Hook. f. et *Oleariae arborescentis* (Forst. f.) Cockayne et Laing ortus, inter parentes intermedius; folia lanceolato-elliptica, apice acuto, margine recurvo, distanten sinuato-dentato.

Shrub originating from the hybridisation of *Celmisia gracilentia* Hook. f. and *Olearia arborescens* (Forst. f.) Cockayne et Laing. Intermediate between parents; leaves lanceolate-elliptic; apex acute; margin recurved, distantly sinuate-dentate.

Holotype: CHR 394214, B.D. Clarkson, 16 November 1982, cultivated Rotorua, ex Mt. Tarawera.



Fig. 1. *XCelmearia ruawahia* 'Nebulous' (from a cultivated plant grown in a shady site at Rotorua, 285 m a.s.l.):

- | | | | |
|---|---|---|---------------|
| a | single flowering branch | b | leaf |
| c | misshapen leaf | d | inflorescence |
| e | stem and lateral branches at ground level; note aerial roots. | | |

Other Specimen: CHR 419631, B.D. Clarkson, 23 October 1985, cultivated.

Parentage: The vegetative and floral characters examined indicate that the putative parents of this hybrid are *Celmisia gracilentia* and *Olearia arborescens*. These two species are abundant at the original locality of the hybrid. A chromosome number of $2n=108$ supports this parentage (Clarkson 1988); the chromosome number of both parents is also $2n=108$.

Distribution: Known only from plants collected by B.D. Clarkson from a rocky outcrop below Ruawahia, on Mt. Tarawera. Prior to 1988 three plants were known to exist there (Clarkson 1988) but since then another three plants have been discovered (Clarkson and Clarkson 1989).

XCelmearia ruawahia 'Nebulous'

The cultivar epithet "Nebulous" is given to one of the original three plants found on Mt. Tawawera that has been introduced to cultivation. The cultivar name "Nebulous" is from the Latin word *nebulosus* which means colours unequally blended or clouded; it is used here in reference to the distinctive leaf coloration.

The following description is based on that provided in Clarkson (1988).

Description: Subshrub 20–50(–100) cm tall. Branchlets 3–5 mm diameter, densely covered in buff tomentum. Leaves lanceolate-elliptic, 19–59 x 5–15 mm, light green with dark mottling when young, dark green with lighter mottling when mature, silvery pellicle on upper surface, moderately tomentose beneath; apex acute; margin moderately recurved, occasionally distantly sinuate-dentate, mainly subentire; venation reticulate; midrib and veins prominent on underside, visible on upper surface. Petiole densely tomentose, c. 30 mm long. Peduncle tomentose. Capitula 6–16 per inflorescence, 19–37 mm diameter; ray florets 12–14, white; disc florets 12–21, yellow.

Discussion

Several other putative hybrids between *Celmisia* and *Olearia* are known and are represented in the herbarium at DSIR, Lincoln (CHR). *Celmisia durietzii* X *Olearia avicenniifolia* (CHR 17628),

described by Simpson and Thomson (1942), was originally collected by James Speden from Arthurs Pass and was cultivated until 1965. Hybrids collected recently include *Celmisia spectabilis* X *Olearia arborescens* from Urewera National Park (A.P. Druce, CHR 208945; A.P. Druce, CHR 190954) and Kaimanawa Mts. (A.P. Druce, CHR 402303) and *Celmisia* sp. X *Olearia* sp. (D.R. Given, CHR 235769) from Lake Waikaremoana. These plants have been grown at the Botany Institute experimental nursery at Lincoln and in a private garden in Wellington. Druce (1977) also records the putative hybrid *Celmisia incana* X *Olearia arborescens*.

XCelmearia ruawahia 'Nebulous' has been grown in a container and as a garden plant. As a garden plant at Rotorua it reached 30 cm by 35 cm after two years; one plant grown in the shade reached 50 cm. A mature plant in cultivation at Omahanui Nursery, Tauranga is now about 1 metre tall and is regularly sheared with clippers to retain a branched and heavily leaved form (B.D. Clarkson pers. comm.).

At the Botany Institute experimental nursery, Lincoln, this hybrid has been grown most successfully in containers. It is ideally suited to container culture as it retains a dwarf and compact habit, not exceeding 20 by 25 cm after six years. These dimensions are similar to those recorded by Clarkson (1988) for wild plants of unknown age. Grown in a container it has been recorded to flower only once in six years.

Flowering of garden grown plants of *XCelmearia ruawahia* 'Nebulous' is usually good for two seasons, but then there is a rapid reduction to little or no flowering in subsequent seasons (B.D. Clarkson pers. comm.). It has not been known to set seed and pollen is only 3% stainable indicating very low viability. Achenes developed on selfed capitula and on those crossed with *C. gracilentia* but none of those examined contained endosperm or embryo; other achenes were sown but none germinated (Clarkson 1988).

XCelmearia ruawahia 'Nebulous' is easily propagated vegetatively. Semi-hardwood cuttings taken during June and July 1991 and placed in an unheated glasshouse formed vigorous, healthy roots in three to four weeks. When tubed these

plants quickly sprouted new shoots and formed an attractive small plant. An interesting and unusual characteristic is that it often forms aerial roots from the woody stems (Clarkson 1988); this indicates that it would be easily propagated from cuttings at any time of the year.

Acknowledgements

I thank Elizabeth Edgar for preparing the Latin diagnosis and Bruce Clarkson, Phil Garnock-Jones, Brian Molloy and Colin Webb for their comments on the draft manuscript. SIR Publishing is thanked for permission to reproduce the line drawing.

References

- Allan, H.H., 1939: Remarks on *XLeucoraoulia*. *Roy. Soc. New Zealand Trans. and Proc.* 68: 457–461.
- Allan, H.H., 1961: Flora of New Zealand Volume I. Government Printer, Wellington. 1085 p.
- Bricknell, C.D.; Voss, E.G.; Kelly, A.F.; Schneider, F.; and Richens, R.H., 1980: International Code of Nomenclature for Cultivated Plants — 1980. Bohn, Scheltema and Holkema. Netherlands. 32 p.
- Clarkson, B.D., 1988: A natural intergeneric hybrid, *Celmisia gracilentia* X *Olearia arborescens* (Compositae) from Mt. Tarawera, New Zealand. *New Zealand J. Bot.* 26: 325–331.
- Clarkson, B.R. and Clarkson, B.D., 1989: Vegetation of the south-eastern dometops of Mt. Tarawera. *Rotorua Botanical Society Newsletter No. 17*: 19–25.
- Druce, A.P., 1977: Trees, shrubs and lianes of New Zealand (including wild hybrids). Unpublished checklist, Botany Division, DSIR, Lower Hutt.
- Greuter, W.; Burdet, H.M.; Chaloner, W.G.; Demoulin, R.; Grolle, R.; Hawksworth, D.L.; Nicholson, D.H.; Silva, P.C.; Stafleu, F.A.; Voss, E.G.; McNeill, J., 1988: International Code of Botanical Nomenclature. Koeltz, Königstein, Germany. 328 p.
- Simpson, G. and Thomson, J.S., 1942: Notes on some New Zealand plants and descriptions of new species. *Roy. Soc. New Zealand Trans. and Proc.* 72: 21–40.
- Webb, C.J. and Druce, A.P., 1984: A natural intergeneric hybrid, *Aciphylla squarrosa* X *Gingidia montana*, and the frequency of hybrids among other New Zealand apioid Umbelliferae. *New Zealand J. Bot.* 22: 403–411.

Stem and Branch: Patterns of Tree-Planting in Central Canterbury since 1852 Part I. The Banks Peninsula Area

Derrick Rooney

P.O. Box 43, Hororata, Canterbury

Trees have been described as the enduring symbols of man's hand in the landscape, and nowhere is this truism more true than in Canterbury.

It has been a remarkable process: the transformation of the Canterbury Plains, in little more than 100 years, from the raw, often windswept and bleak grasslands and thorny scrublands that shocked the settlers used to the soft, old contours of England to an exotic landscape, equally dry and windswept but now modified and sheltered by thousands of kilometres of woodlots and tree belts.

Canterbury's farming history can be traced through its trees, which indicate by their age a pattern of settlement radiating from the earliest points of European contact, and reflect, in the choice of species, both the toughness and the conservatism of the settlers and the rapidity with which some of them came to grips with the climate.

Trees reflect social history also. Old plantings, often in squares enclosing a few moribund fruit trees, indicate the sites of abandoned or demolished dwellings. Changes in planting patterns and the occurrence of certain species in different age classes reveal how information about the trees that best coped with the climate or sheltered crops was shared among the European settlers. The surviving trees of the settlers, many now grown to majestic proportions, are thus not only intrinsically valuable for the silvicultural, horticultural, or botanical information they can yield; they also comprise an important social and historical record, in many cases now entering their declining years and threatened by both old age and changing economic times. As the accelerating trends towards subdivision or aggregation of different types of land continue, many of these old trees will disappear in the next few years.

This paper will locate and describe some of these "living documents" in two key areas of early Canterbury development:

Banks Peninsula (Part I) and Central Canterbury (Part II).

The starting point, however, is not a European tree but an indigenous giant that probably had its first flowering long before even Polynesian man set foot in this country. It is the totara in Montgomery Bush reserve, on the Summit Road, near the Hilltop; a reminder that many such giants were either felled for timber, or merely felled and burnt to clear the hillsides for pastoral farming. Probably no other tree in Central Canterbury can challenge the brooding presence of this giant. It is estimated to be more than 1000 years old (M.J.A. Bulfin, DSIR Botany Division, pers. comm.) and seems now to have reached its maximum size, at a height of 24 m and a diameter at breast height (dbh 1.5 m) of 243 cm (measured by R. Jamieson, Ministry of Forestry and D. Rooney, August, 1991). Some indications of incipient decay are visible, and there may be no more than a century or two left in which to look at it!

Another indigenous tree capable of attaining massive proportions on Banks Peninsula is the matai, *Prumnopitys taxifolius*. S.W. Burstall, during a national survey of notable and historic trees for the New Zealand Forest Service 20 years ago, recorded a specimen of 167 cm dbh in Montgomery Bush (S.W. Burstall *et al.*, NZ Forest Service unpublished mensuration reports). Ross Jamieson and I were unable to find this tree, but we measured a matai in the Hay Reserve in Pigeon Bay, a short distance away, at 171.5 cm dbh. A companion tree measures 116.3 cm. Surrounding vegetation made it impossible to get an accurate sighting to measure their height; we estimated it to be about 25 m. Another fine native tree in this reserve is a pokaka (*Elaeocarpus hookerianus*), 21 m tall and 82 cm dbh. This reserve, on the valley floor beside the main road in Pigeon Bay, also contains some large exotic trees, planted up to a century or more ago by members of the Hay family, who have lived in Pigeon Bay since the 1840s. The family gave this reserve to the nation.

Pigeon Bay was settled in the very early days of European occupation. Fruit trees, and perhaps ornamental trees, were planted there before 1850. So it is appropriate that possibly the biggest, although not the tallest, tree on Banks

Peninsula is the stately Australian mountain ash, *Eucalyptus regnans*, at "Brookshaw", the property of Mr Bruce Goodwin in Starvation Gully Road. The biggest of several big trees in a small grove of eucalypts and conifers in a gully behind the homestead, it was measured (by S.W. Jamieson and D. Rooney, 1991) at 44 m tall and 205 cm dbh. We have not seen a bigger specimen in Canterbury.

Mr Goodwin, who represents the fourth generation of his family to farm in Pigeon Bay, was unable to relate the history of this tree, but believes that it may date from the period before 1890, when "Brookshaw" was farmed by the Kay family. An 1888 photograph of the homestead site (Ogilvie, 1990) shows a grove of young trees, about six metres tall, one of which may be this tree. The Goodwin family, who settled in Pigeon Bay in 1859, originally farmed further up Starvation Gully Road, and bought "Brookshaw" in 1891. They planted macrocarpas, which have grown quite large. Other farmers in Pigeon Bay today are continuing the tree-planting tradition, with extensive young agroforestry blocks.

Over the hill at Akaroa, the old Akaroa Domain, better known as the Garden of Tane, is the home of numerous large exotic trees, some rare in the region. The oldest were planted about 1880 and some are now past their prime. Several of the fine specimens measured by Burstall in 1972 have gone. A recent departure, felled by a wind gust, was the Mediterranean "pencil cypress", *Cupressus sempervirens* 'Stricta'. Measured at 26.5 m in 1971, it was one of the tallest known specimens of this cultivar. Some of the others are ailing, and one rare tree, the western Himalaya fir, *Abies spectabilis* var. *brevifolia*, which was a magnificent specimen more than 26 m tall, with a dbh of 93.5 cm, is moribund.

The Garden of Tane was set aside as a public domain about the time the Akaroa Town Board was formed in 1876. Photographs dating from the 1870s (Ericson, unpublished) show it as a cleared, grassy hillside with scattered regenerating kanuka (*Kunzea ericoides*) some of which survive in the reserve and have grown to a large size. One that we selected at random to measure was 51 cm/19 m. As far as is known, none of the original planting plans from the nineteenth century

Unless otherwise specified, all measurements mentioned in this report were taken in winter, 1991, those on Banks Peninsula by R. Jamieson and the author, and those at The Point, Terrace Station, and Homebush by the author alone. The instruments used were a hypsometer and a standard NZFS diameter tape.

has survived (there may never have been any), but it is known (Ericson, unpublished) that before 1900 the major trees and shrubs had been planted, a network of paths had been made, an ornamental fountain had been built, and tennis courts laid down. After World War I the reserve fell into disrepair, and by the 1960s it was overgrown and choked with blackberry, stumps, and tree suckers. Unauthorised firewooders had removed many of the largest kanuka. A restoration campaign, promoted by a local group of which the late Arthur Ericson was a prominent member, began in the mid-1960s. Mr Ericson and others spent many hours grubbing and spraying weeds, clearing paths, pruning and tidying trees, and removing unwanted trees and sucker growth. He planted the gaps thus created with many native trees and shrubs, and persuaded the Department of Lands and Survey and the Akaroa Borough Council to create a picnic area out of, in his words, "a tangled mess of blackberry, tree-tops, and stumps". Arthur Ericson also persuaded Akaroa businesses to give money for playground equipment.

Although he wrote in 1979 that "My age deters me somewhat" (he was then 69), Arthur Ericson continued to work in the Garden of Tane, clearing tracks, removing unwanted suckers and seedlings, and planting more native seedlings until only a few months before his death in July, 1991.

The garden today stands as a tribute as much to Arthur Ericson as to the anonymous settlers who planted the exotic trees that have grown so massive in their New Zealand situation.

When government departments were reorganised in the 1980s, control of the Garden of Tane passed to the Department of Conservation, which administered it until late in 1991, when responsibility for day-to-day running and maintenance of the garden was handed to the local authority, the Banks Peninsula District Council.

A fine and pleasant place to visit, the Garden of Tane has easy tracks, alongside which most of the major trees are clearly labelled.

One of the big trees, and probably one of the first planted in the Garden of Tane, is a Monterey pine (*Pinus radiata*) on the upper boundary, near the cemetery in Kaik Road. Probably once part of a perimeter row of shelter, this massive tree is 31 m tall, and its trunk has a diameter at breast height (measured in 1991) of 201 cm. Several of its contemporaries still stand on top of a cliff, overlooking the harbour, at the bottom of the garden; one of them is bulkier, with a dbh of 208 cm, but is malformed with three leaders. Their presence is evidence of the rapidity with which *Pinus*



Fig. 1. The trunk of a *Chamaecyparis thyoides* 'Andeleyensis' tree growing in the Garden of Tane, Banks Peninsula. About 110 years old, it measured 68 cm diameter in 1991 (Ross Jamieson, Ministry of Forestry). This selection is often sold in nurseries as a 'dwarf' conifer.

radiata, which was still quite a rare tree in the Northern Hemisphere when these specimens were planted, was propagated and distributed in New Zealand. They are thus of considerable historic interest.

Possibly the finest tree in the Garden of Tane, despite graffiti that have been carved in its trunk, is the Spanish fir, *Abies pinsapo*, which in 1991 stood at 76.5 cm dbh and 28.5 m tall (in 1970 it was measured by Burstall at 65 cm/28 m). This species, although tolerant of adverse conditions, is very slow growing, and must have been among the earliest plantings. It is many metres taller than any other Spanish fir measured in Canterbury and may well be the tallest in New Zealand.

The American western red cedar, *Thuja plicata*, is seldom a satisfactory tree in Canterbury away from the shelter, cooler climate, and higher rainfall of the foothills region, but there is a fine specimen in the Garden of Tane, 26.5 m tall and 112 cm in diameter at breast height. It has

not yet finished; since 1971 it has increased its diameter by 10 cm and its height by nearly two metres. Another *Thuja* species, *T. occidentalis*, is represented in the Hay reserve by several good specimens; one is 116 cm x 22 m.

When young, *Chamaecyparis thyoides* 'Andeleyensis' is an attractive, columnar bush, and is often sold as an ornamental 'dwarf' conifer. The aged specimen in the Garden of Tane (Fig. 1) demonstrates what it can do when given plenty of time and a good site; a handsome large tree, it is 22 m tall with a 68 cm trunk at breast height. This cultivar originated in Andeleys, France, about 1850 and may well have been among the earliest ornamental conifers imported to New Zealand. The size and obvious advanced age of this specimen suggest that it was among the first plantings made in the garden in the late 1870s or early 1880s.

One of the most interesting trees in the Garden of Tane is the ponderosa pine, a species which in New Zealand is

essentially a high-country tree. Some fine stands can be seen inland, and one of the best is at the Point Station, Windwhistle, overlooking the Rakaia Gorge. The old ponderosa pines (*Pinus ponderosa*) in this spectacular stand average about 49 m in height and about 1.25 m in diameter. These were probably planted in the 1860s. On the drier and shallower soils of the plains ponderosa pine is painfully slow growing; it seems to demand the brisker subalpine climate, and is one of the most common introduced shelter trees in the cold intermontane basins, such as the Mackenzie Country, where on good sites, as the stand at the Point demonstrates, it can grow as well as *P. radiata* does in the lowlands. Unfortunately, the ponderosa in New Zealand is of little value, except as shelter or ornament; on sites where *P. radiata* can be grown, ponderosa grows too slowly to be profitable to the forester, and although it is a major timber species in the United States, it yields soft, resinous, weak timber (B.W. Halliday, Selwyn Sawmills Ltd, pers. comm.) when grown in New Zealand. Despite this, the tree has a role, for shelter and ornament, and this is recognised in the existence of fine old specimens in inland homestead plantings. The ponderosa in the Garden of Tane is an outstanding specimen for the coastal region, at 36.5 m tall and 139 cm dbh.

Japanese cedar (*Cryptomeria japonica*) is another handsome conifer seldom seen at its best in the dry Canterbury climate, but it can be grown well in some places on Banks Peninsula. The specimen in the Garden of Tane is outstanding, with a dbh of 71.4 cm and a clear trunk to about 10 m. Its height is 24.5 m. Bhutan pine (*P. wallichiana*), another species usually associated with higher altitudes and cooler climates, is well represented by a tree which, with a dbh of 95.3 cm and a height of 34 m, may well be the best specimen in Canterbury of this uncommon species. Its closest rival is at Homebush Station, near Darfield, 75.2 cm by 33.5 m.

Another outstanding specimen in the Garden of Tane is the Himalayan fir, *Picea smithiana*; some 30 m tall, it has a dbh of 81 cm and is one of the best examples of the species in New Zealand.

Even some plants that are usually regarded as shrubs have grown to large proportions on this sheltered site. There is a tree-sized Chathams akeake (*Olearia traversii*), and a Chinese photinia (*Photinia serrulata*) has reached 18.5 m tall, with a diameter at its bole of 76.5 cm.

The Garden of Tane also boasts good specimens of the Queensland bunya bunya pine (*Araucaria bidwillii*), and the Norfolk Island pine (*A. heterophylla*). An avenue of ageing Norfolk pines stands, incidentally, on the beachfront at Sumner, a suburb of Christchurch, and is probably the most southerly avenue of Norfolk pines in the world.

Takamatua, near Akaroa on Banks Peninsula, has the probable distinction of being the only place in New Zealand to have its name officially changed during World War I to satisfy the patriotic desires of its occupants. For 76 years after European settlement in 1840, Takamatua was known as German Bay; in 1916 it reverted to the original Maori name after watersiders refused to load a cargo of cheese from the German Bay factory. Why German Bay in 1840? When the French vessel *Comte de Paris* arrived at Akaroa in 1840, there was not enough farmland in the main Akaroa bay to settle the whole party. The Germans in the group agreed to settle on the beachfront in the neighbouring bay.

The first English settler was Captain D.B. Muter, who bought a 40.5 ha section behind the German settlement from the Canterbury Association in 1851. Several of the trees that he planted still stand on the property, which is now owned by Mr Stan Kingston. Isolated in paddocks, but visible from the main road to Akaroa, they include walnuts, a large English ash, Lombardy poplar, sycamore, lime, and horse-chestnut. The best of them are the horse chestnut, 113.4 cm dbh and 28 m tall, and the lime, 133.7 cm and 28.5 m. Both are still growing strongly. The horse-chestnut has increased its height by 3 m and its diameter by 11 cm in the last 20 years. It is the tallest of its species recorded in New Zealand, and the lime is the tallest in Canterbury. A very large necklace poplar (*Populus X deltoides*) on the property was measured in 1971 as the second largest in New Zealand (behind a North Island tree) but according to Mr Kingston has since been killed by lightning. Several other old trees on the property were removed because of unsoundness.

Captain Muter, a veteran of the 1848–49 Punjab campaign, bought property in the Geraldine, Waimate, and Duvauchelle districts, and on the banks of the Waimakariri River, as well as his Takamatua farm. The house that he built in Takamatua has long since been demolished, and his stay in New Zealand, which lasted only three years, seems to

be mainly remembered for his fighting a duel with a former resident magistrate at the nearby Robinsons Bay. He returned to India in 1854 to fight in the Mutiny, and subsequently returned to England, where he was knighted for distinguished military service. He lived until the early 1900s, but as far as is known never returned to New Zealand. All of his property in this country had been sold by 1863. Today, the only tangible evidence of his brief encounter with New Zealand is the cluster of old trees on Mr Kingston's property. The house in which Mr Kingston, who is now retired, and his wife live was built about 1900.

The Lyttelton Harbour side of the Peninsula, with its warm northern slopes, which are sweet country for sheep, was one of the earliest areas settled by the Canterbury Association. A legacy of these early immigrants is a number of historic trees.

Among the best known are in the former Bradley property, now administered as a farm park by a trust board. A towering Australian mountain ash on the valley floor is thought to date from about 1851; although the tallest in Canterbury, it is some 30 m short of being the tallest in the country. Equally well known in Canterbury are the massive brown barrel (*Eucalyptus fastigata*) by the entrance to the valley-floor walkway, and an age-worn black mulberry beside the pre-1850 stone building at the stockyards.

The karri (*Eucalyptus diversicolor*), a major hardwood timber species in Western Australia, is very rare in New Zealand. The historic specimen in Morgans Gully, Diamond Harbour, is thus of major importance. Planted by Mark Stoddard about 1854, it is a massive tree with a dbh of 162.2 cm and a height of about 30 m. Since 1954 it has been protected by county ordinance. A plaque attached to the tree describes the karri as the world's "third tallest tree", but this is not accurate. The tallest karri ever measured was 87.1 m, a height exceeded by virgin stands of at least three American conifers (the redwood, the big tree or Wellingtonia, and the Douglas fir) and the Australian mountain ash, which has exceeded 96 m. However, despite the inaccuracy of its citation, the Diamond Harbour karri is certainly a splendid example of a species growing well out of its natural habitat.

References

Ogilvie, G., 1990: Banks Peninsula, cradle of Canterbury. GP Books, Wellington, N.Z.

Greening Wellington — The Roles and Responsibilities of Parks The Ian Galloway Memorial Lecture for 1992

Richard Nanson

3 Rawhiti Terrace, Wellington

When one looks at the beautiful Wellington in which we live today it is hard to imagine the landscape that greeted the first European settlers who arrived aboard the *Tory* in 1839. Much of Wellington, but not all, was covered in coastal broadleaf rainforest dominated by kohekohe, with smaller areas of broadleaf/podocarp forest, remnants of which still remain in the Botanic Garden. Swamp lay between Mt Victoria and the Brooklyn Hills. However, some of the hills had been cleared by Maori for cultivation, and by fires. Mounts Victoria and Albert and the lower Brooklyn Hills were in scrub as were upper parts of the Botanic Garden.

The development of Wellington's green spaces is inextricably bound up in the setting aside of land for a town belt and for a Botanic Garden.

The town belt was set aside in 1840 during the laying out of the city of Wellington. Walter Cook in his excellent talk at last year's Ian Galloway lecture, described in detail its development, so I do not propose to repeat it here. However, it is worthwhile looking at the planting of the town belt and the development of parks around the belt as this is truly where the beautification of Wellington began.

Wellington City did not take over full responsibility for the town belt until March 1873 when it was conveyed to the city by the Superintendent of Wellington Province as instructed in the Wellington City Reserves Act of 1871. The town belt inherited by the Council was bare of anything except gorse, broom and pasture. The timber which in 1840 had covered the Tinakori Hills and other parts of the western town belt, had all but vanished. From 1863 large areas were leased out for grazing, a practice that survived until the 1920s. During the 1870s no planting was carried out on the town belt by the Council. The only significant area planted at this time was the Botanic Garden.

At the same time as the Government was failing in its efforts in the early 1840s to preserve the native forest on the town belt, moves were afoot to establish a Botanic Garden in the city. Land was reserved for this purpose in 1844 when the Botanic Reserve was entrusted to the trusteeship of office holders of the Wellington Horticultural and Botanical Society. This land was just over 12 acres along Tinakori Road and was a portion

of town belt land vested in the Crown. In spite of the initial keen interest in establishing this garden it was not until 1868 that the Botanic Garden Reserve was declared a Public Domain. Development work began the following year. The establishment of the Botanic Garden under the management of the New Zealand Institute commenced. This was to be a major step in the greening of Wellington.

The Botanic Garden

- Preserved a remnant of the forest that once covered much of Wellington.
- Demonstrated how beautification could take place.
- Demonstrated which trees and plants grew well in Wellington.
- Provided a source of trees for Council planting.
- Became a model for the future Wellington landscape.

The next 15 years from 1870 to 1885 was a time of development in the garden. Planting of many tree species and other economic crops took place to trial their suitability for New Zealand conditions. Fences were erected and nurseries established. Conifer trees were very successful and many of the trees raised in the garden were sold or given away to other public domains or reserves throughout New Zealand from Stewart Island to the Bay of Islands. A wide range of ornamental plants was introduced as well as native plants from other parts of New Zealand and the Chatham Islands.

The success of conifer plantings in the garden was soon mirrored by the plantings on the town belt. The first of these took place in the Piri Street/Ellice Street plantation in 1880 using plants from the Botanic Garden. Newtown Park was planted at the same time and after its opening in 1882 became the first playing area/sports ground other than the Basin Reserve. After an initial burst of planting between 1880 and 1883 progress slowed because of the depression of the 1880s and early 1890s. However, this initial period saw the emergence of the Plantation and Recreation Reserves Committee, the first specialised body charged with directing the development of the city's parks. This was a sign that the Council was taking the task of beautification seriously. During the next few years, however, the recession reduced

the revenue from leases on the town belt. The amount of money available to plant and maintain trees was also reduced.

The economic recession also took its toll on the Botanic Garden. Its share of town belt rents and reduced funds from the Government were of concern to the Botanic Garden Board as well as the people of Wellington. The feeling was that the Garden was falling into decay. The Wellington City Council made moves to take over management of the Garden. This was finally achieved on 21 September 1891 with the passing of the Botanic Garden Vesting Act.

The City Council took over a well developed garden with two qualified experienced staff to advise on management matters. As the Garden continued to develop, so did the development of other parks on the periphery of the town belt.

The development of Central Park began as early as 1879 with the Council ordering the removal of a house from the site that had been occupied by a squatter. However, intensive planting did not begin for another 28 years when, between 1907 and 1914, the Baths and Reserves Department established all the large trees on the western and southern slopes of the Park. Then in 1913 the Citizens Easter Carnival Association raised over £2,500 for the development of the Gardens along Brooklyn Road. Ornamental gates were added in 1920 and a children's playground in 1926.

Work on constructing Kelburn Park began in August 1895. It was the second sportsfield on the town belt and the fourth in Wellington after the Basin Reserve, Newtown Park and Athletic Park. It was the first sportsfield whose construction provided outdoor relief work for unemployed men. This initial work stopped in November 1895. Then, as a result of pressure from Wellington's sporting interests, the Victoria College, and the new suburbs now surrounding the Park, work on its completion began in early 1907. It was ready for use in 1908. Also in 1908 the eastern facing slopes below the Park overlooking the city were planted by unemployed workers.

Thorndon Esplanade was an important and much used city park stretching between Davis Street and the junction of Tinakori Road with Thorndon Quay. It faced the water and the Thorndon Baths were part of it. It must have been laid

out in the very late 1880s or early 1890s. Its plantings of pohutukawas resulted from many public Arbour Day ceremonies. It had a bandstand and cast iron seats, two of which are now in the Botanic Garden. One has the plaque on it commemorating the death of John Morris who died trying to save his brother from drowning. They were wagging school and playing on the Thorndon Esplanade waterfront. This park was destroyed in 1927 as a result of the development of new railway yards.

Parks Development after 1900

Public support for beautifying the city was expressed through Arbour Day, the Preservation Society and events like the Easter Carnival fundraising for Central Park (1913). But developments after 1900 in the planting of the town belt and other parks was made possible because of:

(a) The affluence of the times, and the change in the nature of civic government after 1901.

From 1901 councils were elected not by wards, but on the city-wide basis with universal adult suffrage. They began to emerge from a dependence on ratepayers, rate polls and plural voting. It became easier to fund and implement projects for the benefit of the whole city, not just the local ward. Planting the town belt is an example of such a project.

(b) Change in the transport and supply of town milk.

Between 1900 and 1920 it became less and less necessary to lease town belt land for grazing. The rise of the Municipal Milk Department was to force town milk supply dairy farms on the town belt out of business by the end of the 1920s. All of this released land made planting necessary as gorse returned to the now ungrazed pasture land.

These changes also permitted a move away from the view that the town belt was a self-contained economic entity capable of generating revenue for its own development. After 1901 the town belt and other city parks came to be regarded as part of the city as a whole and their development was funded from the rates as a matter of course.

(I think that these sorts of developments, along with the expanding city, provide a context in which to view the large burst of planting from 1907 to 1916 and the even larger burst from 1923 to 1940. They also give added context and reasons for the evolution to an umbrella Parks Department headed by a Director, rather than a direct control by a committee of elected citizens.)

A Reserves Committee ran the City Reserves until 1904 when G.F. Glen was appointed the first Superintendent of Baths and Reserves. He was the first horticultural officer charged with managing the Botanic Garden and other city reserves.

George Glen was also the first of a long line of Parks Directors, all of whom have had practical horticultural training and all lived in the Botanic Garden during their period with the Council. This continuity of Parks Directors has provided a continuity of approach that has served Wellington well.

The Glen Era 1904–1916

During Glen's time planting continued on the town belt and the first community-driven initiatives were started with the establishment of Arbour Day in 1892 and the Scenery Preservation Society which provided plants for many city reserves, including that which is now the site of Victoria University.

The use of bedding plants began under Glen to brighten the Botanic Garden and some parts of the city (e.g. there was a bed down by the Central Library and another at Newtown Library). Gardens were developed at Newtown Park, including a rose garden. Kent and Cambridge Terraces were replanted. The macrocarpas of the late 1870s were replaced by cabbage trees underplanted with native shrubs.

This theme was continued around the Courtenay Place tram terminus and the toilets at the junction of Taranaki Street and Courtenay Place. Cabbage trees were planted along the western edge of Kelburn Park and Kilbirnie Park. Cabbage trees and other hardy shrubs were planted along zigzags giving access to Oriental Bay from the hills behind. Cabbage trees and other shrubs were planted in borders inside the Basin Reserve and there was a huge border of cabbage trees and mixed shrubs along the northern boundary of Newtown Park. In 1906 the Zoological Gardens were developed by Glen. There was a row of cabbage trees outside the Newtown Library.

Planting continued at such a pace that in 1913 a separate Forestry Department was established under the supervision of John McPherson. During the First World War, however, labour was scarce and after 1915 planting slowed down and eventually stopped.

The McKenzie Era 1918–1946

In 1918 the Baths and Reserves Department was restructured and J.G. McKenzie was appointed the first Director of Parks and Reserves. He played a major role in the development of reserves over a period of nearly 30 years. He worked closely with individuals and community groups and also instigated the first training schemes in the department. He was a member of the RNZIH Executive and the Botanic Garden was approved as a training ground for students under the Institute's new Diploma scheme.

One of his major achievements was the establishment, along with Leonard Cockayne, of the Otari Native Plant

Museum, now the Otari Botanic Garden. This unique sanctuary, originally called Wiltons Bush, was designated a Public Domain in 1904 and finally came under the jurisdiction of the Wellington Parks and Reserves Department in 1919. In 1926 a scheme for the development and arrangement of the Otari Open Air Native Plant Museum was prepared by McKenzie and Cockayne. It had four major objectives:

- To establish a collection of all the New Zealand species possible to cultivate in the Museum.
- To produce artificially, various types of the primitive vegetation of New Zealand.
- To restore the present bush area to its original form.
- To illustrate in various ways, the use of indigenous plants for horticultural purposes for the information of those desirous of using such plants in their home gardens.

The Reserves Committee accepted this scheme and Dr Cockayne assisted by Mr A. Mackay carried out further development of the property until Dr Cockayne's death in 1934.

McKenzie had a real interest in the New Zealand flora, and recognised the need to preserve what was left of the native forest around the city. He recognised the value of conserving the Otari Bush, and in a lecture that he gave during the Centennial Exhibition in 1940, he mentioned the large area of native bush in the Botanic Garden which was "interfered with as little as possible so as to let it retain all the characteristics of coastal forest".

His use of native plants around the city in ornamental and town belt plantings also helped them to become better known and used by the general public. Many of the first pohutukawa plantings were carried out by McKenzie, which is where he got his nickname "Pohutukawa Jack". Under McKenzie the greening of Wellington in the terms first established in the Botanic Garden was completed. Between 1923 and 1940 he completed the plantings on the town belt — a huge job for what was still a small Department. Most of the trees were raised by the Department. The plantings built on and to some extent followed the ideas suggested by his predecessors. The extensive use of *Pinus radiata* and macrocarpas was dictated by costs, climate and soils.

By 1932 Mount Victoria was completed. During the 1930s plantings continued on the Tinakori Hills. The blocks making up the plantation along Hutchison Road south of Prince of Wales Park was established during the late 1920s/early 1930s. McKenzie was assisted greatly in this achievement by the availability of cheap labour. From 1920 to 1940 planting the town belt was part of the many work relief schemes for the unemployed. For the same reason, during the late 1920s

and 1930s sportsfields multiplied all over Wellington, many hand hewn!

By the late 1930s much of the planting on the town belt was made up of native plants. McKenzie believed that the pines would provide shelter and nursery cover for eventual regeneration of native forest.

By the time he retired in 1947, Wellington's inner town belt was providing the scenic backdrop so long worked for. It is the largest and most conspicuous legacy left to us from McKenzie's administration. It is also an example of an achievement by the Department forced to adapt its priorities to prevailing social and economic conditions. For example, McKenzie tried unsuccessfully all through his term of office to build a winter garden and supporting glasshouses. He failed, but Hutt succeeded because money and the context of affluent leisure existed. On the other hand, Hutt to a large extent failed to realise his aims on the town belt. A crucial factor in this failure could be seen to be a lack of a large pool of cheap subsidised labour that at the same time was motivated to do a good job. Such a labour force was available to the Parks Department between 1895 and 1940 when most of the town belt plants we see today were planted.

Within the city, gardens were developed and refurbished. In 1927 Glen's plantings on Kent and Cambridge Terrace were removed and the area was laid out more or less as it stands today.

Pigeon Park was laid out on the site of city buildings — the foundations of which were discovered during the development of the present art work on Te Aro Park!

In 1936 the grounds of the Carillon and National Museum were formed and laid out.

In 1940 Queens Park at the bottom of Wadestown Road was remodelled to roughly its present state.

Between 1932 and 1934, Katherine Mansfield Park, Fitzherbert Terrace, was laid out after the removal of an avenue of pines and macrocarpas.

Small green grassed or planted areas edged with brick were formed, witness the kiosk in Post Office Square opposite the new Park Royal Hotel.

The gardens in front of the Railway Station were laid out in 1936.

In many of these developments pohutukawas were used, thus the style of the greening under McKenzie is radically different from the style used by Glen. McKenzie was also responsible for the layout and planting of the Centennial Exhibition Grounds, 1939 to 1940. Oriental Bay was laid out much as it is today — Norfolk pines c. 1924 and grass berms c. 1938 with brick edges.

The Hutt Era 1947–1965

Hutt was a forceful personality who worked tirelessly to increase the money and resources going into the Parks

Department. To a large extent he succeeded and on his retirement Wellington had one of the best funded Parks Departments in the country.

McKenzie had extended the spring bedding displays and introduced large shows of spring bulbs to the Botanic Garden. This was extended by Hutt. This particularly applied to spring tulip displays which reached their greatest extent during the late 1950s. Large parts of the soundshell lawn were used at this time for these tulip displays.

Hutt also initiated an extension of bedding and shrub planting into the traffic islands in the city. Golden ashes and golden elms became a favourite tree. The latter replaced McKenzie's pohutukawas at the bus terminus, Courtenay Place, in the early 1960s.

During Hutt's time there also emerged influential community politicians who supported city beautification. Dame Elizabeth Knox Gilmer, was Chairman of the Reserves Committee during the 1950s. She was a great supporter of the city and a strong defender of the rights of trees, which earned her the nickname of Pohutukawa Kate. Mrs Haines was another prominent Wellingtonian, who donated the *Magnolia campbellii* (1936) on Main Drive and was also involved in the Beautifying Society.

The other organisation was the Wellington Horticultural Society and Dame Elizabeth was certainly involved in this. The Beautifying Society was more of a lobby group and I suspect also worked in concert with other bodies and people, e.g. Ratepayer Associations and Horticultural Societies. I think it would be quite safe to assume that the horticulturalists of the day knew each other and probably belonged to both organisations.

Also during Hutt's time the Beautifying Society emerged, possibly in the late 1920s–1930s. It was used by and supported by McKenzie and Hutt.

The Beautifying Society, as far as I can ascertain, voluntarily folded some time in the 1960s. It would have been after Hutt publicly announced his policy of making the "Pine Age" a thing of the past. The society folded because it believed that it had achieved its goals.

The Plimmer bequest was given in 1958 on the death of Charles Plimmer. Charles Plimmer was a prominent citizen and, according to the newspaper reports, a member of the Beautifying Society. This bequest has provided money for major projects throughout the city including the Mt Victoria lookout, Plimmer's Lane restoration, Plimmer Park on Mt Victoria and the soon-to-be-started cable car lookout redevelopment in the Botanic Garden. Many, many other projects, some small, are often the 'cream on the gingerbread' as far as the 'extras projects' that have been able to be carried out by the Parks and Recreation Department.

Town Belt under Hutt — 1947–1965

During the 1930s, the press and public looked forward with anticipation to the improved effect the new plantations would have on the city. However, in the 1940s, 1950s and 1960s there was an inevitable backlash. As the plantations grew, complaints began to be voiced about lack of sun, vanishing views and gloomy pines. Other public responses were critical of the lack of seasonal colour in the plantations. Thus in the late 1940s, the 1950s and early 1960s there were policies rejecting the use of pines and aimed at producing a town belt planted with native trees and colourful exotic plants.

There was much talk of using flowering gums, wattles, kowhais and more pohutukawas. During the 1950s and early 1960s, quantities of native trees for town belt plantings were grown from seed and cuttings. From about 1955 to 1965, 10,000 ngaio cuttings were grown annually.

In 1961, Hutt was confident enough in his planting programme to announce that Wellington's "Pine Age" would become a thing of the past. He promised that in 20 or more years the results of the new programme would change the appearance of the city. He failed conspicuously to achieve the vision of a town belt full of seasonal colour, and he was only partly successful in establishing native trees. (It is interesting to note that Hutt's policy on the town belt was in part the result of the response to public demand.)

These native plantings have been most successful on south-western areas of the town belt — behind MacAllister Park, behind Stock Street, Newtown, and behind the Winter Show buildings. Lack of adequate follow-up (i.e. gorse cutting) and summer fires caused great losses. Since fires have stopped occurring, over the last 10 years regeneration is achieving the same result.

Under Hutt, Queen Elizabeth Park, Paekakariki, was developed. Also Makara Cemetery, MacAllister Park and Charles Plimmer Park.

The Galloway Era 1965–1986

This is the era during which I joined the Department. It was a period of major change and increase in size. The Director's job became more administrative with delegation to other professions such as engineers and landscape architects, who had such an influence on inner city beautification.

Ian Galloway continued Hutt's ornamentation of the city with the introduction of pocket parks. Inner city parks started with a small garden on the corner of Victoria and Mercer Street, then Glover Park, Cobblestone Park, Midland Park, the upgrading of Oriental Parade and Denton Park. A major development was the planting of the centre of Lambton Quay, a tremendous enhancement of the city. As I recall, it was the first time that

engineers and Parks Department staff had, one might say, got into the proverbial double bed, in their endeavours to ensure the city was improved or enhanced and this incestuous relationship lasted many years as we enjoyed the luxury of 'greened thumbed' engineers.

In the Botanic Garden, the 1968 Wahine Storm created tremendous opportunity for development. The herb garden was built on the spur overlooking the rose garden. Through the generosity of the Norwood family, the waterfall, pond and bench brick shelter and moon gate were made possible. Summer city programmes were introduced and Ian Galloway started the acquisition of land to form the outer town belt.

In the 1960s there was an intense interest in the natural environment which was part of the ecological movement. The issue revolving around the natural environment and our need for open space produced Councillor Spry's criticism of the Reserves Contribution Scheme in 1970 and the programme for preserving Wellington's open spaces of 1974. All of this was to be addressed nationally in the 1977 Reserves Act.

In Wellington it provided the context for establishing an outer town belt; indeed, large tracts of farmland were bought by Council for future landfill sites, together with adjacent land, to provide space for buffer or screen plantings. Unfortunately these were never managed properly and the local farming community quickly developed a jaundiced view of Council's attitude and reasons for purchasing outer town belt land. Such poor management actually put the whole matter on hold for many years as farmers vigorously opposed the purchase of land by Council. The intention was to ensure that the outer town belt be added to the already established Reserves, of Johnson's Hill, Wiltons Bush, Johnsonville and Khandallah Parks and several other large areas of land.

Ian Galloway's period was one of intense beautification by way of colour, traffic island plantings, pocket parks and the marriage of the Parks and Recreation disciplines.

The Richard Nanson Era 1986-1992

My tenure in office has been dominated by increased responsibility in areas other than horticulture and parks. Parks and open spaces are only some parts of a portfolio that includes recreation in its broadest sense, summer city and other recreation programmes, community arts, swimming pools, beaches, foreshores, the Zoo, cemeteries and sportsfields, plant nurseries, Botanic Gardens, city gardens etc. It has also involved, in the last six months, libraries, the Art Gallery and the Michael Fowler Centre.

I have endeavoured in my term to build on the works of my forebears, to ensure

open space has been purchased, plantings increased, that recreation programmes are available for as many as possible, and that they take as many forms as possible. The period initially has been characterised by the large impact of reserve contributions and levies from developments about the city, enabling the Department to undertake many projects and expand on many fronts, pushing the horizons of what it's possible to achieve to the limits. In one of the boom years we had over 100 projects to cope with at one time.

In my view the Botanic Garden's future becomes linked to its past so that it will be radically different from other reserves. Without this we would simply be applying a form of horticultural wallpaper to everything.

The period has been one of considerable change, however, as increasing environmental concerns have come to the fore. I have endeavoured to ensure there has been applied the process of management planning. This has created for the first time a real intellectual basis for forming concepts and uses for our reserves. Not only does this enrich them, but it means that our reserves have developed and will continue to develop into a mosaic of individual parks and reserves and this has only been possible with the assistance of public involvement.

This again has been possible because there has always been a commitment by the Department to see better open local government and an open and consultative process as far as the community is concerned, and I believe this has become the norm. Community input and involvement in the parks network has come to the fore once again. It is important to get our *planning* right.

The purchase of and/or exchange of land, particularly for the skyline and the outer town belt, has meant that we have been able to realise the vision that the organisation has had for such a long time. This and the purchase of and improvement to the valley systems has meant that the Department is in harmony with the Wellington Branch of the Forest and Bird. Their natural Wellington plan is designed to improve and preserve our natural ecosystems in the native plant and animal species of the Wellington city area and to bring native birds back into Wellington.

The preservation of cultural aspects of our heritage, such as Truby King Park in Melrose, Maori fortifications and middens, historical sites, geological sites of interest such as Red Rocks, and the opportunity where possible to return land to the town belt have all been part of the Department's activities over the last few years. Just as the joint purchase by the old Town Planning and Parks and Recreation Departments has meant that as much as possible of the open space about St Gerards has been preserved as one of the city's

most prominent and unique Wellington landmarks.

I have been particularly keen to ensure there is an educational thrust into the nineties. Hence my reason for initiating the Education and Environment Centre in the Botanic Garden and the rebuilt and enlarged Zoo Education Centre. They are educational pivots to take us into the 21st century and a similar educational thrust for Otari is underway.

Friends of the Zoo and the Botanic Gardens have recently been formed to encourage greater public involvement awareness and will increasingly take on a guardianship role, I suspect.

I have endeavoured to ensure the Department has utilised to best advantage the resources of the community with its vision for the future and to capture the enormous potential and the capital base the city has in its land, facilities, and particularly the Department's dedicated and totally committed staff. I know that the teamwork that has developed over the years is the springboard for the future to help lock into place and ensure that the heritage of our past becomes the opportunity for our future.

I have some concerns for the consequences that the new management culture may bring if applied to public parks and reserves. However, it is early days yet and the "colonels" that are within the present culture and Recreation Division will, I am sure, ensure that horticulture flourishes into the 21st century. Certainly the watchdog role of the Friends of the Botanic Garden and Zoo, the RNZIH, Action for Environment, the University and many, many individuals will be looking over these managers' shoulders, as they have done mine for six years, and my predecessors before me.

I have been the fifth Director of Parks and Recreation in Wellington City. I believe we have all served the city well, building on each other's strengths, capturing opportunities and I hope what has been achieved will not be lost. It is up to you, the public, to ensure that it isn't. Horticulture in the city has been in good hands for decades and I hope and trust that we can confirm that this is to be the case in the future.

Let me suggest to you that the process of evolving a management plan currently in progress for the town belt is designed to take place over two years so that as many people as possible have the opportunity to shape the future of the city. One could almost say that the management of the town belt takes us in a full circle from the start of the colony over 150 years ago.

The directions for the next 50 years have been set. We need to get it right to preserve not only the standards we have now achieved but to set goals which will enhance Wellington's environment even further.

Book Reviews

Marlborough Wines and Vines, Volume 1 by Cynthia and Graham Brooks. GP Print, Wellington, N.Z., 1992. ISBN 0-473-01469-6.

In 1973 the Montana company, looking to extend its grape plantings, bought land in Marlborough. The first grape vines were planted in August. Twenty years later, the wines produced from these vineyards have had an impact on the world wine scene that would be beyond the wildest dreams of the Montana Board.

This book looks at the history of wine production in Marlborough through the eyes and ears of Cynthia and Graham Brooks. Both were born and raised in Marlborough, and have seen the growth of the wine industry and impact it has had on the landscape and people of Marlborough. Cynthia and Graham both work for the local *Marlborough Express* newspaper, as a features writer and freelance photographer respectively.

The photographic artistry of Graham, and the intimate knowledge Cynthia has of Marlborough and the local wine industry, are obvious immediately you open the book. Over 250 photographs which, with the exception of the historical prints, are in excellent colour cover the 148 pages. These photographs look at all perspectives of grape and wine production and follow the development of grapes in Marlborough from 1873 to 1992. They complement the text which is largely in the form of interviews with the personalities involved in the industry.

A historical introduction to wine making and grape growing in Marlborough makes fascinating reading. We are all aware of the recent development, but grapes were grown in the province for wine production from about 1873 until the 1960s. However, it was the arrival of the Montana company which planted 635 hectares of flat land in the Renwick, Fairhall and Brancott areas that led to the current industry. Today, Marlborough has the largest area of grapes planted in New Zealand, and most of the countries major wine companies have either established wineries or buy fruit grown in the province. In several instances, these companies have connections with important international wine companies in Australia, France and elsewhere.

After discussing the historical development, the book considers the question, "Why Marlborough?". Some consideration is given to the influence of climate, soils, management and varieties on grapes grown in the province. This section also mentions the services allied to the grape industry that have grown

largely as a consequence of the development of the grape industry. Research, education and engineering all get a mention, together with a review of the Marlborough Grape Growers Association.

Unfortunately the map on page 40 provides little help in describing the wine producing area to someone not familiar with the province. A suitable map showing the vineyards, wineries, and some of the notable features photographed for the book would have helped those unfamiliar with the region.

The most substantial part of the book (almost 100 pages) looks at each of the wineries involved in the region in turn. Cynthia obviously knows all the personalities well, and introduces them in a way that enables the reader to relate to their aspirations and excitement. It is in these pages that Graham's photographic skills come to the fore. The interviews are interspersed with photographs of the wineries, vineyards and people that make up the Marlborough wine industry. Whether it is young buds developing in the spring, vineyards in the mist, dramatic views of winery tanks, or the smiling faces of winemakers, grape growers or vineyard workers, the pictures all tell a story of a determination of purpose. The rows of vines marching off into the distance, or the lightning strike over the vineyard, show the moods of the Wairau Plains, while stainless steel tanks, and all the distorted reflected shapes, produce opportunities which Graham has capitalised to the full. Above all, everyone is obviously enjoying themselves!

As with any review of this sort, the book provides a snapshot of the industry as it was in 1992. Since publication, several new wineries have opened, and the planted area now exceeds 2000 hectares. While phylloxera currently is leading to a massive replanting of vineyards, the growth of the industry shows no signs of slowing. I look forward to the time Graham and Cynthia decide to review the development of the industry again. Marlborough is recognised as being one of the foremost grape-growing areas in the world. I am sure this is a position it will retain.

Marlborough Wines and Vines is a book that you pick up and dip into, and find something new each time. An ideal gift for anyone interested in New Zealand wines, or as a reminder of visit to Marlborough to enjoy the sun, wine and scenery.

Mike Trought

Palms and Cycads beyond the Tropics by Keith Boyer. Palm and Cycad Societies of Australia, Milton, Queensland, Australia, 1992. ISBN 0-9587931-6-6.

With the revival of interest in palms that has taken place in the past 10 years, an authoritative, well illustrated and reasonably priced book was required for the enthusiast.

This volume is all that. It deals with palms and cycads that grow outside the tropics from which choices can be made. The question of availability is another matter and serious growers should join the Palm and Cycad Society of New Zealand which has a seed list offering many of the species so well illustrated in this book.

There is evidence of much research involved in presenting the range of palms and cycads, their characteristics, cultivation, hardiness to cold and pest and disease control. The section on climate I found difficult to follow and I would certainly not rate Auckland and Sydney roughly equal. Auckland is cooler and wetter than Sydney and has much more clay soil areas and long, cold, wet winters with strong south-west winds in comparison to Sydney's warmer temperatures for longer periods and essentially sandy soils. In New Zealand the microclimate is of much more importance than it is in Sydney.

Minor irritations noted include incorrectly hyphenating "gaudichaudia" as a species name and the frequent use of "however" as a conjunction. These apart, the book is an excellent, portable book for the palm and cycad enthusiast and, as such, is highly recommended.

Max Goodey

Plants for Free by Andrew Maloy. Shoal Bay Press, Auckland, N.Z., 1992. ISBN 0-908704-16-X. Recommended price \$19.95.

For the beginner student in horticulture or keen hobbyist with a basic knowledge of plants, this small but comprehensive book is easy to follow and the diagrams are appropriate and clear.

In his introduction Mr Maloy lists the reasons for plant nomenclature and its importance. He also lists the advantages and disadvantages of both seed and vegetative propagation.

Directions are given for the hygienic preparation of implements and utensils, a subject often overlooked.

Seed and potting mixes are discussed and correct storage methods detailed; fertilisers are mentioned.

In the chapter on seeds, rather than the method of watering suggested on p. 22, adequate watering and drainage of containers before sowing precludes 'flooding'.

Perhaps fuller directions and precautions for using fungicides could have been given at this stage.

A most important chapter on cuttings follows. All steps from gathering material to potting on are well researched and presented. However, more information would have been welcome on raising cuttings in the garden. This simple

technique works for many plants without the expense of potting mix, misting and heating. The only reference is a brief one on p. 30.

In the section on grafting and budding, a wider explanation and more examples of non-compatibility would not have gone amiss. The text and diagrams are encouragement to 'give it a go' and, as Mr Maloy implies, 'practice makes perfect'.

The various methods of layering and division are well explained. To try bulb scaling or scooping is a challenge.

Ferns are too often neglected in books on propagation. Mr Maloy's coverage is welcome. Their life cycle is simply explained. Today ferns are popular and it is to this section many readers will turn.

Occasional references to "Mother Nature" in the text are irritating — why not just "nature"?

Mr Maloy has devoted a lot of time and effort to this book; the contents are instructive and the diagrams excellent. I would recommend it to all plantspeople.

Jean Veal

Hawkweeds (*Hieracium*)

Grant Hunter

Landcare, Lincoln, New Zealand

(From *Weed Identification News* 1992 No. 2)

Hawkweeds are a problem in the tussock grassland environments especially in the hill and high country of the eastern South Island. They can reduce the productivity of grasslands for pastoralism to the extent that tens of thousands of hectares have already been degraded to a zero grazing value. They have reduced the nature conservation values of many native grasslands by taking up space that could be occupied by native species. Farmers and conservationists are equally concerned.

These perennial herbs are well adapted to establish competitively and spread into bare ground and grassland or scrub, especially vegetation that is stressed or subjected to poor land-management practices.

But the situation may not simply be one of invasive weeds spreading at the expense of other more desirable species. There is a strongly held view that the hawkweed phenomenon is a symptom of a much greater concern — the weakening of the grasslands in terms of biomass, cover and productivity, and an associated degradation of soils, including a decline in carbon cycling and plant nutrients. A history of burning, grazing, and drought has predisposed the pastoral lands to hawkweed invasion. An implication of this relationship is that, at least in some circumstances, control of hawkweeds in a weed management sense, if it were feasible, would remove plants which may be performing a land

rehabilitation role more effectively than any other species. We don't fully understand the signal that hawkweeds are sending. Is weed control an appropriate response, or do we need to look at changing land management practices in a much wider sense? Probably both are true, and need to be implemented in an integrated fashion. We need to undertake further research, to make new field observations, and to interpret collective management experience to develop the appropriate responses.

Hawkweeds are abundant in the unimproved and semi-improved grasslands from the Wairau River in Marlborough to northern Southland, east of the main divide. They are the dominant species in extensive areas in inland Marlborough (especially the upper Awatere and Clarence Valleys) and the Waitaki basin. The most vulnerable and affected areas are the short tussock grasslands in the relatively dry montane basins and lower slopes up to about 1400 m. Hawkweeds are also abundant at higher elevations in tall tussock grasslands and in humid areas, although in these situations the pre-existing vegetation tends to have a competitive advantage to resist hawkweed dominance. Overall, both geographic distribution and abundance in affected areas is increasing. Hawkweeds also occur in the North Island, where they have modified remnants of short tussock grasslands in the central district.

The four most widely occurring species have differing but overlapping distributions.

Mouse-ear hawkweed (*H. pilosella*) is the most extensively occurring species and comprises the major weed problem from Marlborough to Southland. It forms grey-green, low, tight mats which may almost totally cover some landscapes. Its main distribution is in the dry to moderately dry montane, short-tussock grasslands although it extends up-slope into open, alpine, tall-tussock grasslands.

King devil (*H. praealtum*) is widespread in Canterbury and Marlborough and is more localised in Otago. Because of its upright growth habit it is available to stock and is often particularly conspicuous in ungrazed areas. It has wide rainfall tolerance and occurs from very dry (semi-arid) areas to very wet areas near the main divide.

Tussock hawkweed (*H. lepidulum*) is widespread in Otago and also occurs in Marlborough and Canterbury. It is particularly common in western high rainfall areas. It is an upright-growing, shade-tolerant species commonly associated with forest margins, scrub and tall tussock.

Field hawkweed (*H. caespitosum*) is a lesser-known species partly because of confusion with the similar king devil. It has wide site tolerances and occurs in drier and wetter sites than the other species. It is abundant in alpine, tall-tussock grasslands.

The Challenge of Plant Introduction

Dick Endt

Landsendt, Parker Rd, Oratia, Auckland

Ever since man became involved in growing plants his curiosity made him search for new plants that would not only ensure survival but also enrich the lives of mankind. Today the search for new plants still goes on. As so many plants become extinct through thoughtless destruction of virgin lands worldwide there is urgency to collect as many endangered plants as possible. New Zealand, with its varied temperate to subtropical climate, is an ideal host country for many foreign plants, plants that are becoming endangered.

My personal ambition has been to introduce plants from high-altitude tropical regions, particularly the South American region.

My interest in unusual and exotic plants goes back to the earliest days of my career. Books such as Fairchild's 'The World was my Garden' fired my imagination and awareness of the many useful plants that grow in other countries but are not known in New Zealand. I received my first taste of practical work on plant introduction and development when I commenced work in 1956 at the DSIR research orchard, Havelock North. It was the late Dr Don McKenzie who nurtured my interest in new plants. I became involved in his extensive apple collection, the majority of which were introduced from many different parts of the world. This project was set up to find the best apple varieties suited for New Zealand growing conditions. At harvest time from December to May fruits had to be tasted and evaluated (a sometimes tedious but nevertheless fascinating task) much in the same manner as wines are tasted. Much correspondence was involved with foreign research institutions. The whole project was of a pioneering nature, with only a few staff to do the work, the ultimate target and achievement being to find new promising varieties. My future course was set.

In order to advance my career in horticulture I took a two-year horticulture diploma course which I completed in 1960. In 1962 I purchased my own piece of land. Together with my wife Annemarie we set up our subtropical fruit orchard that was later to develop into a plant collectors' garden, a haven or refuge for many rare and endangered species. Our property in Oratia, known as 'Landsendt' is situated in the foothills of the Waitakere ranges some 25 km west of Auckland City. Rainfall and humidity are high in this region, and the 8.4 ha property is frost free which enabled us to grow nearly

all subtropical fruits which can be grown in New Zealand. In the early years of establishment we relied on the growing of fruit crops such as the tamarillo, passionfruit, kiwifruit and other minor crops. To meet our need for plants we carried out our own plant propagation, doing our own selection to obtain the best quality plants possible.

As time progressed we soon learned that the generally heavy clay soil conditions made it difficult to maintain economic commercial production. Tree deaths caused by soil-borne diseases started to occur. Soil compaction and wet ground conditions limited our ability to grow many crops successfully. Diversification was needed in order to survive. I was fortunate to have had a close working relationship with DSIR which, in many ways, assisted me in my decisions about many of my new ventures. New crops which were evaluated at the Mt Albert Research Centre attracted my interest. I worked closely with Dr Harold Mouat and later Stuart Dawes both of whom carried out valuable work in plant introduction. In time many visitors from overseas came to visit 'Landsendt' in order to see our many and varied collection of plants. Contacts were established overseas in order to obtain new plants.

I realised that there were fruits growing in South America which at that time did not grow in New Zealand. My next challenge therefore was to find a way to go to South America, particularly to high-altitude regions of the Andes. During 1977 I made my first trip to South America, or more precisely Ecuador, a country straddling the Equator on the western shores of the South American continent.

Ecuador is a country of similar landmass to New Zealand. Being on the Equator both the coastal floodplains and the eastern Amazon basin area are hot and humid. The eastern and western lowlands are divided by the massive Andes mountains running north-south through the country. The highest volcanoes in the world are found in this area reaching from 5000 m to 6200 m in height. Between these mountains are the inter Andean plains where most Ecuadorians live. The climate at this altitude is very similar to New Zealand. Plants growing in the mountains at about 2500 m are very well adapted to our northern New Zealand climate. Plant explorers are often praised for their work in the unknown. It must be understood that when working in a country with a very different culture and language it is



Fig. 1. Andean walnut (*Juglans neotropica*), introduced from Ecuador (see overleaf), now growing at Okiwi, Great Barrier Island. The trunk diameter shows 300 mm growth in 10 years from planting.

very difficult to become involved with the local people. I was very fortunate to have met Joy Horton, an American and a resident of South Ecuador. Without her help I would not have succeeded in obtaining all the plants I managed to introduce to New Zealand. She has a vast knowledge of the customs and people. Now married, she and her husband, Curt Hofmann, own and administer a large forest reserve near Loja. Both Curt and Joy have collected many local fruiting plants and ornamentals.

Fruiting Plants Collected in Ecuador

Set out below is a brief description of some of the plants I have collected in Ecuador.

Annona cherimola

The cherimoya is not new to New Zealand. It is recognised that the ultimate cherimoya fruit has yet to be found. We have collected a number of cultivars from Ecuador with perhaps one showing excellent promise. This cultivar is known in Ecuador as 'Tras Gallinero'. Commercial planting of this variety will commence in the near future.

Carica species

Ecuador is the home of many of the high-altitude *Carica* species. Many of them are interesting ornamentals and some are showing particular promise for commercial exploitation. The Babaco, *Carica x heilbornii* nm *pentagona* was first commercialised at 'Landsend' in 1981. Another, *Carica monoica*, we have named 'Sabrosa'. This tree produces smooth orange fruits with a taste and texture much like apricot.

Cyphomandra betaceae

The tamarillo is native to Ecuador. Nearly all the types grown there are of the yellow-fruited kind. We have selected several strains which may become valuable in New Zealand for breeding and selection.

Cyphomandra casana

Closely related to the tamarillo this plant was discovered in mist forests at 2500 m above sea level. Seed was collected in 1977 and introduced to New Zealand. The plants grew well at 'Landsend' but later proved more suited to areas such as Taranaki. The fruits are similar in shape to the tamarillo, dull yellow in colour when ripe. The taste is unusual, somewhere between peach and passionfruit.

Inga edulis

This tree belongs to the legume family. Found growing at high altitude in the mountains of Ecuador mainly around farmhouses, it is planted to provide shade and edible pods as an emergency food. It forms an ideal shade tree for other crops. Nitrogen-fixing root nodules enrich the soil beneath the tree.

Juglans neotropica — the Andean Walnut

This nut tree was first planted at 'Landsend' in 1978. The shape of the nut resembles that of the black walnut. The tree is almost evergreen and very fast growing. The timber is of high quality. The tree is very suited to the northern parts of the North Island as the tree has no chilling requirement.

Solanum quitoense (hybrid *baeza x vestissimum* 8605 — Naranjilla)

This new hybrid naranjilla was first grown at 'Landsend' in 1990. It is generally similar to other naranjillas except that the plant produces large crops of bright orange egg-shaped fruits. It is the first time that economic quantities of naranjillas have been produced in New Zealand.

Ornamental Plants

Anthurium species

There is a great variety of these magnificent tropical-looking plants in the high-altitude forests of Ecuador. We collected two outstanding forms, one, known as 'Ale de Agale'. This form is a



Fig. 2. Fruit of naranjilla (*Solanum quitoense*, hybrid *baeza x vestissimum* 8605) grown at Oratia, New Zealand.



Fig. 3. *Geonoma* palms in Ecuador. These rare palms are now established at 'Landsend', Oratia, New Zealand.

climber growing against the trunks of trees. The glossy green hastate leaves lend a rather tropical appearance to our New Zealand garden. It grows well outside in our conditions. Perhaps the most spectacular of all the *Anthurium* species is a rosette form, a large epiphytic plant growing on big trees or sometimes on rocky outcrops. The rather leathery green leaves, 1.5 m in length, are arranged in a circle around the crown, there being no

stem. The plant grows at 2500 m altitude in the Andes. In New Zealand it grows well outside.

Lonicera species — Arupo

This plant, a native of Ecuador, is often planted in parks and private gardens. No one I have contacted in Ecuador can tell me its botanical name for certain, only that it is called 'Arupo'. The shrub drops its leaves in August when it commences flowering, smothering the whole shrub or small tree in pink flowers. Young plants are growing well at 'Landsend'.

Cassia canescens

This is common in Ecuador as a plant growing in waste places. It resembles *Cassia* 'John Ball' except that it will flower at any time of the year. In New Zealand it self sows readily. It is a striking plant which tolerates poor soils.

Cecropia albida

This tree, common in the Amazon basin area, is known locally as the ant tree. The hollow-stemmed tree harbours ants and both tree and ants benefit. The ants obtain sugar secretions from the base of the leaf stems. In return, the ants protect the leaves of the tree from insect pests. In New Zealand the tree grows with a single stem until about 5 m high. It then branches out horizontally much like a frame of an umbrella. The large peltate leaves about 1 m in diameter, are carried on 80 cm leafstalks held out horizontally. The leaves are silver green in colour. The newly forming leaves are protected by a bract cover which is bright red or pink. The tree is singularly spectacular in all stages of growth and grows well on our farm. It will not tolerate much frost when young.

Oreopanax species

Several forms and species of this plant were introduced from Ecuador. Both young stems and leaves are pubescent, being covered in rusty-coloured fine hair, and are very eye-catching. It grows at 'Landsend'. The tree is difficult to propagate.

Palm Species

There are many palms growing in Ecuador at high altitude. Few if any have ever been grown in New Zealand. We have introduced a number of palms such as the 'Cococumbe' (*Parajubaea cocoides*), various species of *Geonoma*, *Chamaedorea* and others. One palm considered endangered on the Juan Fernandez Islands off the coast of Chile has been successfully introduced to New Zealand. This palm (*Juania australis*) is rare worldwide because it is so difficult to establish. Our New Zealand climate seems very well suited to this plant.

The above lists only briefly describe some of the plants we have introduced from Ecuador. Over a period of 15 years we have made five visits to that country, and on each occasion we have learned more about the plants growing there. The description of these plants in itself is perhaps not the only interesting side. Our activities have. The many new plants introduced, not only from Ecuador but also from many other parts of the world through the exchange of seeds, have transformed 'Landsend' into a very exotic place as the new plants reach maturity.

The role of 'Landsend' has changed from what started off as a subtropical fruit orchard to a kind of botanical garden supported by a nursery producing exotic plants, both ornamental and fruit-

bearing. A new generation of fruits are growing on the property such as taro, bananas, babaco and cherimoya, and work continues in selecting newly introduced fruits. To expand on the production of subtropical fruit a new piece of land was purchased on Great Barrier Island with soils and growing conditions for subtropical fruits far superior to those in Oratia. Our son Gerald is presently managing the orchard on the Island. The main crops grown for export are the cherimoya and tamarillo.

What is the future for 'Landsend'? After my time I cannot foresee a continuation of the work that my wife and I have been undertaking. The property is only 30 minutes away from downtown Auckland. Besides a unique

collection of plants there is also the oldest house in West Auckland, a pioneer house built in the early 1860s. I would like to see the property developed into some kind of botanical park to prevent the loss of the collection of plants. Too many valuable collections have been lost in the past because of the lack of appreciation at the time the decision was taken to change or destroy the site. Had more time been allowed to 'mature' the vegetation a different view would have been taken to preserve them. Once such rare plants are lost it is not only a loss to the garden but to New Zealand. In this age of wholesale plant destruction, particularly in South America, New Zealand may become a last refuge for endangered plants.

Re-documenting Your Garden's Lost Accessions

Scot Medbury

Honolulu Botanical Garden, Hawaii

How old is that tree?" "Where did it come from?" These questions are among those most commonly posed by both researchers and casual visitors to botanical gardens. Documentation of basic information such as sources and planting dates for our living collections is central to the mission of most gardens, yet every curator can point to at least a few plants of indefinite age and origin. These "mystery plants" are coming under increasing scrutiny today. Newly redefined missions, rising maintenance costs and a shrinkage in land available for planting are causing gardens to re-evaluate their undocumented collections. In some instances it may prove impossible to track down information about undocumented plants; in others, however, it is simply a matter of pooling information compiled from multiple sources.

The causes for a lack of documentation are as diverse as the undocumented plants themselves. Gardens created from former parks or estates will often have little or no information about dates or sources of early plantings. But even in gardens originally intended as botanical gardens, basic collection information may have gone unrecorded or was lost due to inadequate staffing, incomplete curatorial practices or the loss of records to fire or flooding. Many North American gardens early in this century focused primarily on the acquisition and establishment of their living collections and only adopted systematic accessioning, labelling and

mapping procedures later. The best collections' management practices still seem to leave room for error; yesterday's minor labelling or mapping error can lead to major quandaries in the future.

Garden professionals differ in their opinions on the importance of collections documentation. Like other controversial issues, the problem is best resolved by referring to the garden's mission. It may be imprudent for a small garden whose primary purpose is landscape display to expend limited staff time keeping detailed records on the origins and history of its collections, let alone to attempt to date and source their "mystery plants". Every trip down memory lane can be a journey of several days' duration, often leading right back to the starting point. But for the garden that maintains plant collections for conservation and research, provenance information is of critical importance, especially with wild-collected plants (but also with collections of cultivars). In addition to the research potential, the interpretive value of a plant is also enhanced by good source and planting data. If time and trained staff are available to research the background of your undocumented plants, a once-through the entire collection is advisable since information on a particular specimen often turns up serendipitously in unrelated records.

Opinions also range about what to do with plants for which information has gone unrecorded or been lost. Again, depending upon the mission of the

institution and the size of the garden, an extreme, but defensible approach might be to resolve problems of this type with a chainsaw, gradually replacing undocumented plants with specimens of better known provenance. Several North American gardens are gradually implementing this strategy. A specimen's horticultural condition and the degree to which the taxon is duplicated within the collection is evaluated along with its level of documentation when making a decision to remove it.

In other cases, it may be worthwhile re-accessioning plants in hopes of later matching them back up with their collection and planting data. In older gardens, the undocumented specimens are often the garden's most mature trees and therefore, the most admired and revered. For good reason, gardens will not, or cannot, cut down these sentinels. Nevertheless, the task of re-documenting existing collections is a challenging one. Rarely can you be absolutely sure that you have made the right match, especially since the same taxon may have been planted at different times and places. Therefore, it is always best to corroborate your suspicions about a particular specimen independently using several sources.

In a botanical garden, common sense and a knowledge of past procedures will guide you in rediscovering lost planting and source information. Obviously, the best place to look is in the institution's own records. Accession books, propagation

records, nursery invoices, correspondence files, planting-out lists, sketch maps, inventories and other documents may supply good clues to an unlabelled plant. Compile evidence on location, source, accession number, planting date and horticultural treatments taking care to note the source of each piece of information. If someone hasn't already done so, take the time to write out a description of the various record systems and practices used over the years at your garden, as best as you understand them.

Most gardens have refined their approach to collections' documentation over the years; knowing the intricacies of older, abandoned systems can be crucial to unravelling the past of your undocumented plants. When researching specific plants also consider the condition of valuable source materials and take steps to preserve and protect them. If the information contained in old card files is not completely duplicated elsewhere, have them microfilmed.

It is quite easy to become sidetracked into a full-blown taxonomic verification project when trying to trace the history of your lost accessions. While also important and ultimately essential, verifying a plant's identity will rarely solve documentation problems since the plant may have been received under an entirely different name. At the Honolulu Botanical Gardens, where we have extensive collections of wild species from throughout the world's tropics, the name assigned by the field collector who sent a plant to us may be considerably different from the name eventually decided upon by a monographer of the genus or family. Bearing this in mind, taxonomically verifying the identity of undocumented plants makes a good starting point in a re-documentation effort, especially when

different taxa that are indistinguishable to the untrained eye are planted in the vicinity.

Synonymy can pose problems as well. Nomenclature may have been updated by staff over the years, so the name applied when the plant was received may not be even listed today as a synonym.

In the case of historic gardens, the journals, diaries and letters of those involved with the garden's early history form valuable source materials. These documents may be found in university or state and local historical society libraries.

If a design firm was involved in the development of the garden, it may be easy to track down materials relating to their commission. In researching early plantings at the University of Washington Arboretum, whose original master plan was prepared by the Olmsted Brothers, I was able to consult the archival resources of the Library of Congress and the National Park Service's Olmsted National Historic Site. The Hunt Institute for Botanical Documentation in Pittsburgh and the Catalog of Landscape Records at Wave Hill in New York are a few other excellent sources for material on plants and the American landscape. Old nursery catalogues supply another rich vein of material and also help with problems arising from synonymy. The USDA's research station in Beltsville, Maryland, maintains a large collection of nursery catalogues and inventories which are available to researchers.

Oral accounts can often provide the sort of corroborating evidence needed to confirm the history of a particular plant. On a conservation project I conducted at New Zealand's Pukekura Park, the input of the director emeritus was crucial to uncovering the history of the park's extensive tree collections. This man had

witnessed and participated in more than 40 years' worth of collection development. Long-time or retired gardeners also can provide priceless information about undocumented plants. When conducting interviews, you should be careful not to supply your informants with too much specific information lest you prompt their replies. Consider bringing a tape recorder. With the help of garden oldtimers, try to compile a list of names for different geographic areas within the garden (e.g. the main terrace, oak tree glen or "Nick's area") since such designations often change with the times and can help to unlock puzzles later.

Other written sources, such as newspaper articles on a ceremonial planting or the first flowering of a rare plant, can also be quite revealing. Public libraries often keep a clipping file on local gardens. At the Washington Park Arboretum in Seattle, a clippings file helped us to realise that a group of flowering cherries that were later moved from the Arboretum to a prominent position on the University campus were in fact the Arboretum's first plantings.

Human history attests to the maxim that those who don't learn from the mistakes of the past are doomed to repeat them. By re-documenting our lost accessions, we also expose the vulnerable practices in our present curatorial programmes. The biggest lessons are the most simple: title, date and initial all records, no matter how trivial, and label, label, label! By developing solid but streamlined accessioning, labelling and mapping procedures, we can avoid the frustrations of retracing our steps in search of that critical link between curatorial records and undocumented plants in the field.

(Reproduced from *The Public Garden* 1992, 7(2): 12.)

Towards a National Garden Scheme

Neil Robertson

Westport, Ferrier Rd, New Gisborne, Victoria 3438, Australia

In his article in *The Englishman's Garden*, Christopher Lloyd has something to say about private gardens and the responses they can evoke. Speaking of "the art of letting plants enjoy themselves in an unplanned way" as they do at Great Dixter, he adds: "This is what gives to all private gardens, where the owners are deeply involved, a living identity, highly charged, idiosyncratic, absolutely genuine ... each one unique. And it is this that visitors to private gardens so much enjoy: the feeling that the place is loved and lived in, even if it is not one hundred percent organised and tidy."

Visiting gardens is just about my favourite pastime. This is fortunate, as I visit dozens, if not hundreds, of gardens each year in connection with my work for Victoria's Garden Scheme. In this I am obviously not alone, as thousands of Victorians have visited gardens offered through the scheme during the past six years. Of course, my reaction to each garden is quite different, varying from unadulterated admiration to the equally pleasant realisation that my own garden pleases me rather more than any that I have seen on that day.

Victoria's Garden Scheme is a joint project of the Australian Broadcasting Corporation's Radio Division and the Royal Horticultural Society of Victoria. Its day-to-day activities are administered by a voluntary committee; we employ a coordinator, and a panel, of which I am the chairman, selects the gardens for each year's programme. The scheme was originally funded by a one-off grant from Residential Developments P/L but since then it has been completely self-funding. Indeed, the scheme has generated surpluses which, in line with its aims, have been used to fund garden-related projects throughout Victoria. To date, more than \$100,000 has been directed to works in public and private gardens.

We have given money for the installation of watering systems at Buda at Castlemaine and at Barwon Grange at Geelong, for tree surgery at Mt Boninyong at Scotsburn, Merriang Homestead at Myrtleford and Turkeith at Birregurra.

We provided funds to help with the labelling of the plant collections at VCAH Burnley and at the Peter Francis Points Arboretum at Coleraine and several other equally worthwhile projects.

When establishing the garden scheme the committee relied to some extent on the model of the National Garden Scheme of England and Wales and also Scotland's Garden Scheme, but today Victoria's Garden Scheme, although retaining some similarity to those schemes, differs in several important aspects. Most notable among these is that we acknowledge the fact that many gardeners who participate in the scheme should receive some recompense for their troubles, and to this end 35 per cent of the gate takings are returned to the owners. Of course, they may exercise the option of donating this to charity but, unlike the British schemes, they can keep the money and offset against the costs of opening. Having opened my garden for the scheme three years ago, and having undertaken to do so again this year (on the principle that if I go around vetting other people's gardens I should expose my own to public scrutiny), I am very well aware that nobody does it for the money involved.

Why, then, do we open our gardens?

I suppose that there will be just about as many reasons as there are gardens in the scheme, but I'm inclined to believe that as most gardeners enjoy looking at gardens they enjoy giving pleasure in return. Unfortunately the garden club competitions rather serve to deter people from entering the scheme, but I have always been at pains to tell prospective openers that we are not on about judging the gardens we open.

The gardens reflect their creator's interest, be it in plants, design, or simply in creating a pleasing living environment, and the most successful gardens, of which St Erth is a shining example, are those where the presiding genius's personality pervades the whole garden. I spend a lot of time climbing onto a soap box on this subject, invoking gardens like St Erth, Bolobek, Cruden Farm and many others less well known, as examples of gardens with tremendous personality.

So, in opening gardens I look for originality, for gardens which reflect the differing interests, means and aspirations that are likely to be represented among our garden visitors. At the end of the day you may learn more from a garden which introduces you to new plants or a different philosophy design than from a garden sympathetic to your own tastes.

Victoria's Garden Scheme has been so well received by gardeners that we are exporting the concept, and the guidebook which will be published in August will be entitled *Gardens of Australia; the Guidebook to the Garden Schemes of the ACT and Southern New South Wales, Tasmania and Victoria*. We plan to offer visitors 120 gardens in Victoria, 50 in Tasmania and between 50 and 60 in southern New South Wales. As I write, the coordinator for each scheme is putting the finishing touches to what will be a truly splendid calendar of openings. Committees have been appointed to oversee these schemes and the expansion has been made possible by loans from Victoria and one-off grants from a number of other organisations. To coordinate the regions, a national committee has been established and this will be chaired by Mrs Malcolm Fraser, whose garden, Nareen, has been featured under Victoria's Garden Scheme.

As part of the celebration of the birth of the National Scheme, Christopher Lloyd will visit the participating States in November 1992, where he will visit some of our gardens and give talks. But this is only the beginning of a truly National Scheme: one day I hope that it will be possible to visit gardens from Perth to Sydney and from Cape York to Tasmania. Already, though, it is possible to visit gardens of great diversity, gardens built in different climates and to suit a range of unlikely sites. More importantly, these openings provide an opportunity for gardeners to meet and exchange ideas while all the time adding to our collective gardening heritage.

(Reproduced from *Landscape Australia* 1992 (2) 134.)

New Zealand Plant Collection Register Update No. 3: 1st March 1993

Dr. Keith Hammett

488c Don Buck Road, Massey, Auckland 8, New Zealand

New Zealand is very rich in both native and introduced flora (Webb, Sykes & Garnock-Jones, 1988, *Flora of New Zealand* vol. IV). It is important to know not only which plants are in the country but where they are located and how vulnerable specific taxa might be to loss. This is especially so for introduced plants and for specific cultivars since the source of such germplasm, both wild and cultivated, is being rapidly eroded in some areas and is being made unavailable from others. New Zealand has already proven itself to be a "Noah's Ark" for some plants and cultivars.

The Plant Collection Group of the Royal New Zealand Institute of Horticulture is attempting to build up a register of plant collections, of all sizes, held in New Zealand.

Such a register is essential and will have many uses. It will be of value to nurserymen and gardeners seeking plants new to their range. It will offer the opportunity to avoid the reintroduction of germplasm already in the country, thus reducing the risks of importing further pests and diseases and the intricacies and delays of quarantine. Plant breeders will see such a list as a guide to available germplasm for breeding programmes. However, its most important purpose will be as a guide to the vulnerability of each species or cultivar. Clearly if plants are grown widely they are much less likely to be lost than if only a few specimens exist in one or a few collections.

Often collections exist only because of the enthusiasm of individuals. Bureaucratic institutions and commercial operations frequently prove to be poor long-term custodians of germplasm. Unfortunately valuable collections are all too often lost when their collectors become too old or die. Once a register is established the horticultural community will be in a better position to assess plants and collections which are vulnerable and steps can be taken to remedy the situation.

The register will never be complete as plant holdings change constantly. However, it is hoped that now it has been started it will prove to be a focal point and enthusiasts will see gaps and will help to keep it as up-to-date and useful as possible.

Small collections are as valuable as large ones. In fact taxa may be safer

distributed in a mosaic of many small collections rather than concentrated in a few large ones. Don't consider your collection too small to list. You may be the sole holder of a particular plant. Unless it is listed no one knows. The register was initially compiled in March 1992 from returns received from a questionnaire sent out during 1991 and from letters received in response to an article by Mike Oates in the June 1989 issue of *New Zealand Gardener*. Many important gaps were obvious. Following a limited distribution of the first version, individuals pointed to unlisted collections and these were added to the register. This enabled Update No. 2 to be produced in July 1992. Increased publicity and distribution of the second list produced a steady flow of information which has almost doubled the number of collections listed.

At this stage the register is still best seen as an informal working list rather than an authoritative one handed down by an august body. It is currently only an index to collections rather than individual plants. Recently the NZ Lottery Grant Board made a grant to the RNZIH to investigate the publication of more detailed information.

Some groups such as the Herb Federation have already done much valuable work and have started to publish lists of plants held in various collections. Those collections detailed in the Herb Federation of New Zealand publication "Individual Plant Collections" (1992) are indicated by the sign [2] in this update.

Similarly, Marion MacKay has produced the valuable publication "A survey and evaluation of the distribution of selected exotic tree genera in private collections in New Zealand" (1990), in association with the New Zealand members of the International Dendrology Society. The seventeen genera dealt with in this study are indicated by the sign [1]. At this time, no attempt has been made to detail in the register separately the 33 collections covered by Marion's survey.

The important work carried out on individual trees over many years by S.W. Burstall must not be overlooked and should be seen as an adjunct to the register. His findings are recorded in eight "Unpublished" reports produced between

1970 and 1974 as "Historic and Notable Trees of New Zealand". They cover the country by regions and are cited as Forest Research Institute Mensuration Reports.

A condensation of this work was formally published by S.W. Burstall and E.V. Sale as "Great Trees of New Zealand" (1984) by Reed Publishing. However, it is the unpublished mensuration reports which are of greatest value in connection with our current work.

As twenty or more years have passed since Burstall carried out his work and as he recorded individual trees distributed widely on properties large and small (often single trees in suburban home gardens), it is probably not practicable to integrate his data with this register of collections. Burstall's work does, however, provide a stunning insight into the wealth of plant material at our disposal, some indication of the effort needed to quantify it and just how much one enthusiastic individual can achieve.

If a wide range of people connected with plants in New Zealand make a contribution, whether they be botanists, plant collectors, breeders, nurserymen or home gardeners, we can produce and maintain a working index of our plant resource which will benefit both ourselves and will help to ensure the continued existence of as many plants as possible.

I am very grateful to all the people who have provided information thus far, and apologise for not having been able to answer all their letters individually.

If you have information to contribute to the register please contact: Dr.K. R. W. Hammett, 488c, Don Buck Road, Massey, Auckland 8.

Abbreviations used in the register are as follows:

Gen	Number of genera held
Spp	Number of species held
Cvs	Number of cultivars/accessions held
[1]	See MacKay (1990).
[2]	See Herb Federation of New Zealand. Individual Plant Collections (May 1992).
Records:	
C	Complete
P	Partial
H	Hand records
Cp	Computer records
AIS	Additional Information Supplied

New Zealand Plant Collections No. 3, 1 March 1993

No	Collection	Gen	Spp	Cvs	Records	Holder	Town	Address	AIS
Generic Collections									
1	Abies [1]		59	6		MacKay Survey '90	Countrywide		
2	Acacia		31	1	P/Cp	Dunedin Bot Garden	Dunedin	PO Box 5045	√
3	Acaena				C/Cp	Landcare	Lincoln	PB ChCh	x
4	Acca					Hort Research Inst	Palmerston Nth	Batchelar Ag Centre, Highway 57	
5	Acer		25			Dennis Schwarz	Wanaka	Box 216	x
6	Acer					Harrisons Trees	Palmerston Nth	RD1	√
7	Acer		16	19		New Plymouth DC	New Plymouth	Liardet Street, Private Bag	x
8	Acer		23	17	C/H	Timaru Bot Garden	Timaru	PO Box 522	√
9	Acer		7	14	C/H	Tupare QEII Trust	New Plymouth	487, Mangorei Road, RD1	√
10	Acer [1]		90	63		MacKay Survey '90	Countrywide		
11	Actinidia			155		Hort Research Inst	Palmerston Nth	Batchelar Ag Centre, Highway 57	
12	Adiantum		6			Mrs A. Lau	Paraparaumu	Main Road north.	√
13	Aesculus					Harrisons Trees	Palmerston Nth	RD1	
14	Aesculus [1]		16	10		MacKay Survey '90	Countrywide		
15	Agapanthus				P/H/Cp	Auckland Bot Gdn	Auckland	102, Hill Road, Manurewa	x
16	Agapanthus					Bill Dijk	Tauranga	Daffodil Acre, PO Box 834	√
17	Agathis australis					Cornwall Park Trust	Auckland	Groves in Cornwall park	x
18	Agave		55			Martin Walker	Port Charles	Moehau Community, RD, Coromdl.	√
19	Agave					S. Mieke	Rotorua	PO Box 228	x
20	Albizia					Harrisons Trees	Palmerston Nth	RD1	
21	Allium					Bill Dijk	Tauranga	Daffodil Acre, PO Box 834	√
22	Allium [2]		24		P/H	B. Rathbone	Dunedin	107, Glenelg St, Bradford	√
23	Alnus					Harrisons Trees	Palmerston Nth	RD1	
24	Alnus [1]		26	6		MacKay Survey '90	Countrywide		
25	Aloe		110			Martin Walker	Port Charles	Moehau Community, RD, Coromdl.	√
26	Aloe					S. Mieke	Rotorua	PO Box 228	x
27	Alstroemeria					Bill Dijk	Tauranga	Daffodil Acre, PO Box 834	√
28	Amaryllis					Bill Dijk	Tauranga	Daffodil Acre, PO Box 834	√
29	Amaryllis (belladonna)		10+		P/H	T. Hatch	Pukekohe East	RD2	x
30	Amaryllis (belladonna)					Ray Wood	New Plymouth	172, Corbett Road, No 3 RD	x
31	Androcymbium					Bill Dijk	Tauranga	Daffodil Acre, PO Box 834	√
32	Anemone					Bill Dijk	Tauranga	Daffodil Acre, PO Box 834	√
33	Anomalesia					Bill Dijk	Tauranga	Daffodil Acre, PO Box 834	√
34	Anomatheca					Bill Dijk	Tauranga	Daffodil Acre, PO Box 834	√
35	Antholyza					Bill Dijk	Tauranga	Daffodil Acre, PO Box 834	√
36	Arisaema		12			E. Walton	Hamilton	15, Joanna Place	x
37	Artemisia [2]		c14			M. Newlove	Oamaru	33, Chelmer St.	√
38	Artemisia [2]		c30			M. Wightman	Feilding	Oranga Plants, Port St	√
39	Albuca					Bill Dijk	Tauranga	Daffodil Acre, PO Box 834	√
40	Asplenium		12			Mrs A. Lau	Paraparaumu	Main Road north.	√
41	Azalea (Evergreen)		5	92+		New Plymouth DC	New Plymouth	Liardet Street, Private Bag	x
42	Babiana					Bill Dijk	Tauranga	Daffodil Acre, PO Box 834	√
43	Begonia					Graham Hardwick	Takaka	Beautiful Begonias	
44	Begonia					Rev. David Self	Manaia	Self's Nurseries	
45	Begonia (tuberous)			45+		New Plymouth DC	New Plymouth	Liardet Street, Private Bag	x
46	Bergenia		3	18	C/Cp	Gordon Collier	Taihape	Titoki Point, RD 1.	√
47	Betula		c15		C/H	A & R. Reid	Outram	Traquair, Box 5	√

New Zealand Plant Collections No. 3, 1 March 1993, continued

No	Collection	Gen	Spp	Cvs	Records	Holder	Town	Address	AIS
48	Betula					Harrisons Trees	Palmerston Nth	RD1	
49	Betula [1]		43	8		MacKay Survey '90	Countrywide		
50	Blechnum		13			Mrs A. Lau	Paraparaumu	Main Road north.	√
51	Brunsvigia					Bill Dijk	Tauranga	Daffodil Acre, PO Box 834	√
52	Buddleia		16			C. Ryan	Hastings	Broadleaf Orchard, Miller Rd	√
53	Callistemon				P/H/Cp	Auckland Bot Gdn	Auckland	Hill Road, Manurewa	x
54	Calluna					Coehaven	Otaki	150, Rangiuru Road	√
55	Calochortus					Bill Dijk	Tauranga	Daffodil Acre, PO Box 834	√
56	Calostemma					Bill Dijk	Tauranga	Daffodil Acre, PO Box 834	√
57	Calydorea					Bill Dijk	Tauranga	Daffodil Acre, PO Box 834	√
58	Camellia				P/H/Cp	Auckland Bot Gdn	Auckland	Hill Road, Manurewa	x
59	Camellia		9	175		Bason Botanical Res	Wanganui	Rapanui Rd, RD 4.	√
60	Camellia					Duncan & Davies	New Plymouth	Les Jury Trust Hybrids	x
61	Camellia		26	173	P/Cp	Dunedin Bot Garden	Dunedin	PO Box 5045	√
62	Camellia					Eden Gardens	Auckland	Eden Garden	x
63	Camellia					Neville Haydon	Takanini	Camellia Haven, 80, Manuroa Rd.	
64	Camellia		23	100+		New Plymouth DC	New Plymouth	Liardet Street, Private Bag	x
65	Camellia					Pukeiti Rhodo Trust	New Plymouth	RD4, Taranaki	x
66	Camellia					Timaru Bot Gdns	Timaru	2, King George Place,	√
67	Canna			120	C/H	Podgora Gardens	Waipu	Box 46	√
68	Cardiocrinum					Bill Dijk	Tauranga	Daffodil Acre, PO Box 834	√
69	Carmichaelia				C/Cp	Landcare	Lincoln	PB ChCh	x
70	Carya		c25	c5	C/H	K.R.W.Hammett	Auckland	488c, Don Buck Rd, Massey, Ak 8	√
71	Carya [illinoensis]					A. Frampton	Auckland	4. Coates Avenue, Orakei	x
72	Carya [illinoensis]					K. Brehmer	Auckland	121, Avondale Road, Avondale	x
73	Carya [illinoensis]					O. Long	Auckland	28, Highland Road, Mt Albert	√
74	Carya [illinoensis]					P. Ryburn	Pokeno	Serpetts Road, RD	x
75	Catalpa					Harrisons Trees	Palmerston Nth	RD1	
76	Cercis					Harrisons Trees	Palmerston Nth	RD1	
77	Chamaecyparis obtusa					Jim Rumble	New Plymouth		
78	Chasmanthe					Bill Dijk	Tauranga	Daffodil Acre, PO Box 834	√
79	Chimonanthus					Harrisons Trees	Palmerston Nth	RD1	
80	Chionodoxa					Bill Dijk	Tauranga	Daffodil Acre, PO Box 834	√
81	Chlidanthus					Bill Dijk	Tauranga	Daffodil Acre, PO Box 834	√
82	Clematis		20		C	C & J Nicholls	Tauranga	Pyes Pa Road, RD 3.	
83	Clematis				C/Cp	Landcare	Lincoln	PB ChCh	x
84	Clivia					Bill Dijk	Tauranga	Daffodil Acre, PO Box 834	√
85	Colchium					Bill Dijk	Tauranga	Daffodil Acre, PO Box 834	√
86	Conophytum					Martin Walker	Port Charles	Moehau Community, RD, Coromdl.	√
87	Convallaria		1	5	C/Cp	Gordon Collier	Taihape	Titoki Point, RD 1.	√
88	Cooperia					Bill Dijk	Tauranga	Daffodil Acre, PO Box 834	√
89	Coprosma				P/H/Cp	Auckland Bot Gdn	Auckland	Hill Road, Manurewa	x
90	Coprosma			c40	C/Cp	Landcare	Lincoln	PB ChCh	x
91	Cordyline					Duncan & Davies	New Plymouth	Waitara Rd, Brixton	x
92	Cornus					Harrisons Trees	Palmerston Nth	RD1	
93	Corylus					Harrisons Trees	Palmerston Nth	RD1	
94	Cotinus					Harrisons Trees	Palmerston Nth	RD1	
95	Crassula					Martin Walker	Port Charles	Moehau Community, RD, Coromdl.	√
96	Crataegus					Harrisons Trees	Palmerston Nth	RD1	
97	Crinum					B. Rathbone	Auckland	info. via E. Walton	x

New Zealand Plant Collections No. 3, 1 March 1993, continued

No	Collection	Gen	Spp	Cvs	Records	Holder	Town	Address	AIS
98	Crinum		10	15	C/Cp	E. Walton	Hamilton	15, Joanna Place	x
99	Crinum					J. Forrest	Tauranga	33, Upland Road	x
100	Crinum					Ray Wood	New Plymouth	172, Corbett Road, No 3 RD	x
101	Crinum		10+		P/H	T. Hatch	Pukekohe East	RD2	x
102	Crocoshmia					Bill Dijk	Tauranga	Daffodil Acre, PO Box 834	√
103	Crocus					Bill Dijk	Tauranga	Daffodil Acre, PO Box 834	√
104	Crocus			c134	C/Cp	Challenger	Little River	"Kereru" Okuti Valley, Cant	√
105	Cyanella					Bill Dijk	Tauranga	Daffodil Acre, PO Box 834	√
106	Cyathea		5			Mrs A. Lau	Paraparaumu	Main Road north.	√
107	Cyathea (Fisher)		6		C/Cp	Gordon Collier	Taihape	Titoki Point, RD 1.	√
108	Cyclamen					Bill Dijk	Tauranga	Daffodil Acre, PO Box 834	√
109	Cyclamen					Noel McMillan	Ohinewai	Box 145, Huntly	x
110	Cymbidium		20	185		New Plymouth DC	New Plymouth	Liardet Street, Private Bag	x
111	Cypella					Bill Dijk	Tauranga	Daffodil Acre, PO Box 834	√
112	Cypella		6			E. Walton	Hamilton	15, Joanna Place	x
113	Cyrtanthus					Bill Dijk	Tauranga	Daffodil Acre, PO Box 834	√
114	Dacrydium cupressinum					Cornwall Park Trust	Auckland	Groves in Cornwall park	x
115	Dahlia		c12	c400	C/Cp	Auckland Bot Gdn	Auckland	Hill Road, Manurewa	
116	Dahlia					Ballinger & Johns	Rongotea	O'Tara Birch Gardens, PO Box 81	√
117	Dahlia		c12	c500	C/Cp	K.R.W.Hammett	Auckland	488c, Don Buck Rd, Massey, Ak 8	√
118	Dahlia			c300	C/Cp	L. Brown	Whangaparaoa	Dahlia Haven, 12 Scott Rd.	
119	Dahlia					Mrs F. Campbell	Te Puke	PO Box 147	
120	Dahlia					Mrs M. Musson	Christchurch	411, Ilam Road, Fendalton	
121	Dahlia					W & K. Jack	Northope	Belle Fleur Gardens, No 4 Rd, Inver	√
122	Dendranthema			89	H/Cp	Auckland Domain	Auckland	PO Box 7107, Wellesley St.	√
123	Deutzia				P/H/Cp	Auckland Bot Gdn	Auckland	Hill Road, Manurewa	x
124	Deutzia					Harrisons Trees	Palmerston Nth	RD1	
125	Dianthus			>100	C/Cp	K.R.W.Hammett	Auckland	488c, Don Buck Rd, Massey, Ak 8	√
126	Dianthus				H/Cp	Mrs E. Cochrane	Nelson	228, St Vincent St.	√
127	Dicksonia		5		C/Cp	Gordon Collier	Taihape	Titoki Point, RD 1.	√
128	Dicksonia		3			Mrs A. Lau	Paraparaumu	Main Road north.	√
129	Dierama					Bill Dijk	Tauranga	Daffodil Acre, PO Box 834	√
130	Dietes					Bill Dijk	Tauranga	Daffodil Acre, PO Box 834	√
131	Diospyros			50	C	Hort Research Inst	Palmerston Nth	Batchelar Ag Centre, Highway 57	
132	Dipidax					Bill Dijk	Tauranga	Daffodil Acre, PO Box 834	√
133	Doodia		3			Mrs A. Lau	Paraparaumu	Main Road north.	√
134	Enkianthus					Pukeiti Rhodo Trust	New Plymouth	RD4, Taranaki	x
135	Erica					Coehaven	Otaki	150, Rangiuru Road	√
136	Erica					Timaru Bot Gdns	Timaru	2, King George Place,	√
137	Erythronium					Bill Dijk	Tauranga	Daffodil Acre, PO Box 834	√
138	Eucalyptus		65		P/Cp	Dunedin Bot Garden	Dunedin	PO Box 5045	√
139	Eucharis					Bill Dijk	Tauranga	Daffodil Acre, PO Box 834	√
140	Eucomis					Bill Dijk	Tauranga	Daffodil Acre, PO Box 834	√
141	Eucryphia		5	13		Blue Mountain Nurs	Tapanui	Bushy Hill Street, West Otago	x
142	Euphorbia		65			Martin Walker	Port Charles	Moehau Community, RD, Coromdl.	√
143	Fagus					Harrisons Trees	Palmerston Nth	RD1	
144	Fagus [1]		7	15		MacKay Survey '90	Countrywide		
145	Ferraria					Bill Dijk	Tauranga	Daffodil Acre, PO Box 834	√
146	Forsythia					Harrisons Trees	Palmerston Nth	RD1	
147	Fragaria			114	C	Hort Research Inst	Palmerston Nth	Batchelar Ag Centre, Highway 57	

New Zealand Plant Collections No. 3, 1 March 1993, continued

No	Collection	Gen	Spp	Cvs	Records	Holder	Town	Address	AIS
148	Fraxinus					Harrisons Trees	Palmerston Nth	RD1	
149	Fraxinus [1]		35	8		MacKay Survey '90	Countrywide		
150	Freesia					Bill Dijk	Tauranga	Daffodil Acre, PO Box 834	√
151	Fritillaria					Bill Dijk	Tauranga	Daffodil Acre, PO Box 834	√
152	Fuchsia (species)		c12			K.R.W.Hammett	Auckland	488c, Don Buck Rd, Massey, Ak 8	√
153	Galanthus					Bill Dijk	Tauranga	Daffodil Acre, PO Box 834	√
154	Galanthus		3	18	C/Cp	Gordon Collier	Taihape	Titoki Point, RD 1.	√
155	Galaxia					Bill Dijk	Tauranga	Daffodil Acre, PO Box 834	√
156	Galtonia					Bill Dijk	Tauranga	Daffodil Acre, PO Box 834	√
157	Gasteria					Martin Walker	Port Charles	Moehau Community, RD, Coromdl.	√
158	Geissorhiza					Bill Dijk	Tauranga	Daffodil Acre, PO Box 834	√
159	Gelasine					E. Walton	Hamilton	15, Joanna Place	x
160	Ginkgo					Harrisons Trees	Palmerston Nth	RD1	
161	Gladiolus					Bill Dijk	Tauranga	Daffodil Acre, PO Box 834	√
162	Gleditsia					Harrisons Trees	Palmerston Nth	RD1	
163	Gloriosa					Bill Dijk	Tauranga	Daffodil Acre, PO Box 834	√
164	Graptopetalum					Martin Walker	Port Charles	Moehau Community, RD, Coromdl.	√
165	Gunnera		9		C/Cp	Gordon Collier	Taihape	Titoki Point, RD 1.	√
166	Habranthus					Bill Dijk	Tauranga	Daffodil Acre, PO Box 834	√
167	Haemanthus					Bill Dijk	Tauranga	Daffodil Acre, PO Box 834	√
168	Hamamelis					Harrisons Trees	Palmerston Nth	RD1	
169	Hardenbergia		3	4	C	C & J Nicholls	Tauranga	Pyes Pa Road, RD 3.	
170	Haworthia		80			Martin Walker	Port Charles	Moehau Community, RD, Coromdl.	√
171	Hebe				P/H/Cp	Auckland Bot Gdn	Auckland	Hill Road, Manurewa	x
172	Hebe		63	28	P/Cp	Dunedin Bot Garden	Dunedin	PO Box 5045	√
173	Hebe			c120	C/Cp	Landcare	Lincoln	PB ChCh	x
174	Hebe					Univ of Canterbury	Christchurch	Christchurch 1	x
175	Hechtia					Martin Walker	Port Charles	Moehau Community, RD, Coromdl.	√
176	Hedera		4	80	C/Cp	Blue Mountain Nurs	Tapanui	Bushy Hill Street, West Otago	√
177	Helleborus		5	20+	P/H	T. Hatch	Pukekohe East	RD2	x
178	Hemerocallis					Ray Wood	New Plymouth	172, Corbett Road, No 3 RD	x
179	Herbertia					Bill Dijk	Tauranga	Daffodil Acre, PO Box 834	√
180	Herbertia		c4			E. Walton	Hamilton	15, Joanna Place	x
181	Hermodactylus					Bill Dijk	Tauranga	Daffodil Acre, PO Box 834	√
182	Hesperantha					Bill Dijk	Tauranga	Daffodil Acre, PO Box 834	√
183	Hessia					Bill Dijk	Tauranga	Daffodil Acre, PO Box 834	√
184	Hibiscus				P/H/Cp	Auckland Bot Gdn	Auckland	Hill Road, Manurewa	x
185	Hibiscus					Harrisons Trees	Palmerston Nth	RD1	
186	Hippeastrum					Bill Dijk	Tauranga	Daffodil Acre, PO Box 834	√
187	Homeria					Bill Dijk	Tauranga	Daffodil Acre, PO Box 834	√
188	Homoglossum					Bill Dijk	Tauranga	Daffodil Acre, PO Box 834	√
189	Hosta		13	160	C/Cp	Gordon Collier	Taihape	Totoki Point, RD 1.	√
190	Hosta					Pukeiti Rhodo Trust	New Plymouth	RD4, Taranaki	x
191	Hoya					Mrs Stella M. Curry	Rotorua	PO Box 1812	x
192	Humulus			50	C	Hort Research Inst	Palmerston Nth	Batchelar Ag Centre, Highway 57	
193	Hyacinthella					Bill Dijk	Tauranga	Daffodil Acre, PO Box 834	√
194	Hyacinthoides					Bill Dijk	Tauranga	Daffodil Acre, PO Box 834	√
195	Hydrangea					Harrisons Trees	Palmerston Nth	RD1	
196	Hydrangea			14	C/H	Mrs B.A. Parker	Blenheim	61, Nelson Street, Marlborough	
197	Hymenocallis		10			E. Walton	Hamilton	15, Joanna Place	x

New Zealand Plant Collections No. 3, 1 March 1993, continued

No	Collection	Gen	Spp	Cvs	Records	Holder	Town	Address	AIS
198	Hypoxis					Bill Dijk	Tauranga	Daffodil Acre, PO Box 834	√
199	Idesia					Harrisons Trees	Palmerston Nth	RD1	
200	Ilex [1]		27	21		MacKay Survey '90	Countrywide		
201	Iris					Bill Dijk	Tauranga	Daffodil Acre, PO Box 834	√
202	Iris			24	H	ChCh Iris Circle	Christchurch	Mr P.R.Isles, 50, Woodville St	√
203	Iris					M. Fairburn	Featherston	PO Box 28	x
204	Iris		250	50	H/Cp	Maria Fairburn	Featherston	PO Box 28, Rimutaka Hill Rd.	x
205	Iris					Ray Wood	New Plymouth	172, Corbett Road, No 3 RD	x
206	Iris					Thomas Iris Garden	Christchurch	ChCh C C Botanical Services	x
207	Iris					Timaru Bot Gdns	Timaru	2, King George Place,	√
208	Iris					Wallis Garden	Masterton	Queen Elizabeth Park Fernery	x
209	Ixia					Bill Dijk	Tauranga	Daffodil Acre, PO Box 834	√
210	Jasminium		7	2	C	C & J Nicholls	Tauranga	Pyes Pa Road, RD 3.	
211	Juglans		c5		P/H	K.R.W.Hammett	Auckland	488c, Don Buck Rd, Massey, Ak 8	√
212	Juniperus [1]		41	102		MacKay Survey '90	Countrywide		
213	Kalanchoe					Martin Walker	Port Charles	Moehau Community, RD, Coromdl.	√
214	Kennedya		6		C	C & J Nicholls	Tauranga	Pyes Pa Road, RD 3.	
215	Kolkwitzia					Harrisons Trees	Palmerston Nth	RD1	
216	Laburnum					Harrisons Trees	Palmerston Nth	RD1	
217	Lachenalia					Bill Dijk	Tauranga	Daffodil Acre, PO Box 834	√
218	Lachenalia		30+	50-60	P/H	T. Hatch	Pukekohe East	RD2	x
219	Lagerstroemia					Harrisons Trees	Palmerston Nth	RD1	
220	Lapeirousia					Bill Dijk	Tauranga	Daffodil Acre, PO Box 834	√
221	Lastreopsis		4			Mrs A. Lau	Paraparaumu	Main Road north.	√
222	Lathyrus		c74	c750	C/Cp	K.R.W.Hammett	Auckland	488c, Don Buck Rd, Massey, Ak 8	√
223	Lavandula [2]		18	>29	C/Cp	V. McNaughton	Christchurch	c/o B. Button, Longstaffs Rd, RD4	√
224	Leptopteris		3			Mrs A. Lau	Paraparaumu	Main Road north.	√
225	Leptospermum				P/H/Cp	Auckland Bot Gdn	Auckland	102, Hill Road, Manurewa	x
226	Leucocoryne					Bill Dijk	Tauranga	Daffodil Acre, PO Box 834	√
227	Leucojum					Bill Dijk	Tauranga	Daffodil Acre, PO Box 834	√
228	Lilium					Bill Dijk	Tauranga	Daffodil Acre, PO Box 834	√
229	Lilium					Frank Chambers	Opunake	Te Namu Rd., RD 31	x
230	Lilium (species, not hybrids)					Stephen Austin	Christchurch 4	45, Lynfield Avenue, Ilam	x
231	Lilium (Ina Mumberson Coll)		30			NZ Lily Society	Christchurch 5	101, Innes Road, c/o Ted Alexander	x
232	Liquidambar					Harrisons Trees	Palmerston Nth	RD1	
233	Lithops					Martin Walker	Port Charles	Moehau Community, RD, Coromdl.	√
234	Lithops		380			S. Mieke	Rotorua	PO Box 228	x
235	Littonia					Bill Dijk	Tauranga	Daffodil Acre, PO Box 834	√
236	Lonicera		13		C	C & J Nicholls	Tauranga	Pyes Pa Road, RD 3.	
237	Lophomyrtus			c20	C/Cp	Landcare	Lincoln	PB ChCh	x
238	Lycoris					Bill Dijk	Tauranga	Daffodil Acre, PO Box 834	√
239	Macadamia [tetraphylla]					O. Long	Auckland	28, Highland Road, Mt Albert	√
240	Magnolia				P/H/Cp	Auckland Bot Gdn	Auckland	Hill Road, Manurewa	x
241	Magnolia					Harrisons Trees	Palmerston Nth	RD1	
242	Magnolia					Peter Cave	Cambridge	Information vis R. Ferguson	
243	Magnolia					Pukeiti Rhodo Trust	New Plymouth	RD4, Taranaki	x
244	Magnolia		13	5	C/H	Tupare QEII Trust	New Plymouth	487, Mangorei Road, RD1	√
245	Magnolia [1]		44	87		MacKay Survey '90	Countrywide		
246	Malus		12			C. Ryan	Hastings	Broadleaf Orchard, Miller Rd	√
247	Malus		8			Dennis Schwarz	Wanaka	Box 216	x

New Zealand Plant Collections No. 3, 1 March 1993, continued

No	Collection	Gen	Spp	Cvs	Records	Holder	Town	Address	AI S
248	Malus					Harrisons Trees	Palmerston Nth	RD1	
249	Malus			c500	C	Hort Research Inst	Palmerston Nth	Batchelar Ag Centre, Highway 57	
250	Malus [1]		34	40		MacKay Survey '90	Countrywide		
251	Mammillaria		70		P/Cp	Dunedin Bot Garden	Dunedin	PO Box 5045	√
252	Mammillaria					Martin Walker	Port Charles	Moehau Community, RD, Coromdl.	√
253	Masdevallia		70+	102+		New Plymouth DC	New Plymouth	Liardet Street, Private Bag	x
254	Massonia					Bill Dijk	Tauranga	Daffodil Acre, PO Box 834	√
255	Melaleuca [alternifolia]					A. Frampton	Auckland	4, Coates Avenue, Orakei	x
256	Melasphaerula					Bill Dijk	Tauranga	Daffodil Acre, PO Box 834	√
257	Melicytis				C/Cp	Landcare	Lincoln	PB ChCh	x
258	Moraea					Bill Dijk	Tauranga	Daffodil Acre, PO Box 834	√
259	Morus					Harrisons Trees	Palmerston Nth	RD1	
260	Muscari					Bill Dijk	Tauranga	Daffodil Acre, PO Box 834	√
261	Myrsine				C/Cp	Landcare	Lincoln	PB ChCh	x
262	Narcissus					Bill Dijk	Tauranga	Daffodil Acre, PO Box 834	√
263	Nerine					Bill Dijk	Tauranga	Daffodil Acre, PO Box 834	√
264	Nerine					M.D.Hollows	Palmerston Nth	Jackeytown Rd, Rangiotu	
265	Nerine		10	100+	P/H	T. Hatch	Pukekohe East	RD2	x
266	Nomocharis					Bill Dijk	Tauranga	Daffodil Acre, PO Box 834	√
267	Nothofagus		11		C/H	A & R. Reid	Outram	Traquair, Box 5	√
268	Notholirion					Bill Dijk	Tauranga	Daffodil Acre, PO Box 834	√
269	Nyssa					Harrisons Trees	Palmerston Nth	RD1	
270	Olea			18	H/Cp	Mrs T. Blumenfeld	Grovetown	212A, Rarangi, RD3, Blenheim	√
271	Origanum [2]		c18			M. Newbery	Oamaru	8 ORD,	√
272	Ornithogalum					Bill Dijk	Tauranga	Daffodil Acre, PO Box 834	√
273	Oxalis					Bill Dijk	Tauranga	Daffodil Acre, PO Box 834	√
274	Paeonia		4	40		Blue Mountain Nurs	Tapanui	Bushy Hill Street, West Otago	x
275	Pamianthe					Bill Dijk	Tauranga	Daffodil Acre, PO Box 834	√
276	Pandorea		3	5	C	C & J Nicholls	Tauranga	Pyes Pa Road, RD 3.	
277	Parthenocissus		4	5	C	C & J Nicholls	Tauranga	Pyes Pa Road, RD 3.	
278	Passiflora		11		C	C & J Nicholls	Tauranga	Pyes Pa Road, RD 3.	
279	Persea			80	C	Hort Research Inst	Palmerston Nth	Batchelar Ag Centre, Highway 57	
280	Philadelphus				P/H/Cp	Auckland Bot Gdn	Auckland	Hill Road, Manurewa	x
281	Philadelphus					Harrisons Trees	Palmerston Nth	RD1	
282	Phormium				P/H/Cp	Auckland Bot Gdn	Auckland	Hill Road, Manurewa	x
283	Phormium		2	c50	C/H	DOC	Taupo	PO Box 644, Napier	√
284	Phormium		2	c50	C/H	DOC	Gisborne	PO Box 644, Napier	√
285	Phormium				C/H	F. Clark	Waitara	No 43 RD, Tikorangi, Taranaki	x
286	Phormium			c125	C/Cp	Landcare	Lincoln	PB ChCh	x
287	Phormium		2	52	C/Cp	Landcare	Havelock Nth	Goddards Lane, PB	√
288	Phormium		2	c50		W.B.Fyers	Tuakau	38, Church St	√
289	Phymatosorus		3			Mrs A. Lau	Paraparaumu	Main Road north.	√
290	Picea [1]		41	24		MacKay Survey '90	Countrywide		
291	Pieris				P/H/Cp	Auckland Bot Gdn	Auckland	Hill Road, Manurewa	x
292	Pieris					Pukeiti Rhodo Trust	New Plymouth	RD4, Taranaki	x
293	Pinus [1]		124	7		MacKay Survey '90	Countrywide		
294	Pinus [pinia]					A. Frampton	Auckland	4, Coates Avenue, Orakei	x
295	Pittosporum				P/H/Cp	Auckland Bot Gdn	Auckland	102, Hill Road, Manurewa	x
296	Pittosporum			c35	C/Cp	Landcare	Lincoln	PB ChCh	x
297	Platanus					Harrisons Trees	Palmerston Nth	RD1	

New Zealand Plant Collections No. 3, 1 March 1993, continued

No	Collection	Gen	Spp	Cvs	Records	Holder	Town	Address	AIS
298	Pleione		6	61	C/H	Blue Mountain Nurs	Tapanui	Bushy Hill Street, West Otago	√
299	Podocarpus totara					Cornwall Park Trust	Auckland	Groves in Cornwall park	x
300	Polystichum		4			Mrs A. Lau	Paraparaumu	Main Road north.	√
301	Polyxena					Bill Dijk	Tauranga	Daffodil Acre, PO Box 834	√
302	Populus					Harrisons Trees	Palmerston Nth	RD1	
303	Populus					Landcare	Aokautere		
304	Primula					Kirsten Otter	Marton	Kakariki Road	√
305	Primula					Pukeiti Rhodo Trust	New Plymouth	RD4, Taranaki	x
306	Primula [polyanthus]					J. Hobbs	Auckland	Bot Gdn, 102, Hill Road, Manurewa	x
307	Primula [polyanthus]					K.R.W.Hammett	Auckland	488c, Don Buck Rd, Massey, Ak 8	√
308	Primula [polyanthus]					Noel McMillan	Ohinewai	Box 145, Huntly	x
309	Prunus		29	85	C/H	A & R. Reid	Outram	Traquair, Box 5	√
310	Prunus		20			Dennis Schwarz	Wanaka	Box 216	x
311	Prunus					Harrisons Trees	Palmerston Nth	RD1	
312	Prunus			400		Hort Research Inst	Palmerston Nth	Batchelar Ag Centre, Highway 57	
313	Prunus [1]		51	79		MacKay Survey '90	Countrywide		
314	Pseudopanax					Frank Chambers	Opunake	Te Namu Rd., RD 31	x
315	Pteris		3			Mrs A. Lau	Paraparaumu	Main Road north.	√
316	Pulmonaria		c10			E. Walton	Hamilton	15, Joanna Place	x
317	Punica					Harrisons Trees	Palmerston Nth	RD1	
318	Pyrus					Harrisons Trees	Palmerston Nth	RD1	
319	Pyrus			c200	C	Hort Research Inst	Palmerston Nth	Batchelar Ag Centre, Highway 57	
320	Pyrus [1]		13	1		MacKay Survey '90	Countrywide		
321	Quercus					Harrisons Trees	Palmerston Nth	RD1	
322	Quercus		c20		P/H	K.R.W.Hammett	Auckland	488c, Don Buck Rd, Massey, Ak 8	√
323	Quercus [1]		153	20		MacKay Survey '90	Countrywide		
324	Rhododendron					Cross Hills Gardens	Kimbolton	State Highway 54, Manawatu	x
325	Rhododendron		120	300	P/Cp	Dunedin Bot Garden	Dunedin	PO Box 5045	√
326	Rhododendron			122		Marlborough DC	Blenheim	PO Box 443	x
327	Rhododendron		40+	200+		New Plymouth DC	New Plymouth	Liardet Street, Private Bag	x
328	Rhododendron		400+	1000+	H	Pukeiti Rhodo Trust	New Plymouth	RD4, Taranaki	x
329	Rhododendron					Timaru Bot Gdns	Timaru	2, King George Place,	√
330	Rhododendron					Univ of Canterbury	Christchurch	Christchurch 1	x
331	Rhododendron [vireya]					Joll Hoskins	Whangarei		
332	Rhododendron [vireya]					M. Cullinane	Levin	PO Box 631	x
333	Rhodohypoxis					Bill Dijk	Tauranga	Daffodil Acre, PO Box 834	√
334	Ribes					Harrisons Trees	Palmerston Nth	RD1	
335	Robinia					Harrisons Trees	Palmerston Nth	RD1	
336	Romulea					Bill Dijk	Tauranga	Daffodil Acre, PO Box 834	√
337	Rosa					Harrisons Trees	Palmerston Nth	RD1	
338	Rosa					Ken Nobbs	Te Kawhata		
339	Rosa					NZ Nat Rose Soc	Palmerston Nth		x
340	Rosmarinus [2]			9	C/H	E. Petrie	Rangiora	Swannanoa Lea, RD1, Nth Cantab	√
341	Rubus			130		Hort Research Inst	Palmerston Nth	Batchelar Ag Centre, Highway 57	
342	Salix					Landcare	Aokautere		
343	Salvia [2]		67	22	C/H	A & G. Genge	Invercargill	Marshwood Gdns, Leonard Rd, RD4	√
344	Salvia [2]		c100		P/H/Cp	Auckland Bot Gdn	Auckland	102, Hill Road, Manurewa	√
345	Sandersonia					Bill Dijk	Tauranga	Daffodil Acre, PO Box 834	√
346	Sarracenia		8		C/H	Heather Frederick	Auckland	43, Endeavour St, Blockhouse Bay	x
347	Scadoxus					Bill Dijk	Tauranga	Daffodil Acre, PO Box 834	√

New Zealand Plant Collections No. 3, 1 March 1993, continued

No	Collection	Gen	Spp	Cvs	Records	Holder	Town	Address	AI S
348	Schizostylis					Bill Dijk	Tauranga	Daffodil Acre, PO Box 834	√
349	Scilla					Bill Dijk	Tauranga	Daffodil Acre, PO Box 834	√
350	Sedum					Martin Walker	Port Charles	Moehau Community, RD, Coromdl.	√
351	Senecio					Martin Walker	Port Charles	Moehau Community, RD, Coromdl.	√
352	Solanum muricatum			c100	C/Cp	Hort Research Inst	Palmerston Nth	Batchelar Ag Centre, Highway 57	
353	Sophora		4	15		Bason Botanical Res	Wanganui	Rapanui Rd, RD 4.	√
354	Sorbus		19	7		Dennis Schwarz	Wanaka	Box 216	x
355	Sorbus					Harrisons Trees	Palmerston Nth	RD1	
356	Sparaxis					Bill Dijk	Tauranga	Daffodil Acre, PO Box 834	√
357	Spiloxene					Bill Dijk	Tauranga	Daffodil Acre, PO Box 834	√
358	Spiraea				P/H/Cp	Auckland Bot Gdn	Auckland	Hill Road, Manurewa	x
359	Spiraea					Harrisons Trees	Palmerston Nth	RD1	
360	Sprekelia					Bill Dijk	Tauranga	Daffodil Acre, PO Box 834	√
361	Synnotia					Bill Dijk	Tauranga	Daffodil Acre, PO Box 834	√
362	Syringa					Harrisons Trees	Palmerston Nth	RD1	
363	Tamarix					Harrisons Trees	Palmerston Nth	RD1	
364	Tecophilaea					Bill Dijk	Tauranga	Daffodil Acre, PO Box 834	√
365	Thunbergia		7	2	C	C & J Nicholls	Tauranga	Pyes Pa Road, RD 3.	
366	Thymus [2]		13	26	P/H	D & I Rennie	Renwick	66, Alma Street, Marlborough	√
367	Tigridia					Bill Dijk	Tauranga	Daffodil Acre, PO Box 834	√
368	Tilia					Harrisons Trees	Palmerston Nth	RD1	
369	Tilia [1]		19	2		MacKay Survey '90	Countrywide		
370	Trillium					Bill Dijk	Tauranga	Daffodil Acre, PO Box 834	√
371	Trillium		17	4	C/Cp	Gordon Collier	Taihape	Totoki Point, RD 1.	√
372	Tritonia					Bill Dijk	Tauranga	Daffodil Acre, PO Box 834	√
373	Tropaeolum					Bill Dijk	Tauranga	Daffodil Acre, PO Box 834	√
374	Tulipa			180		P.E. Fairclough	Stratford	Bordyke Tulips, PO Box 229	x
375	Ulmus					Harrisons Trees	Palmerston Nth	RD1	
376	Vallota					Bill Dijk	Tauranga	Daffodil Acre, PO Box 834	√
377	Veltheimia					Bill Dijk	Tauranga	Daffodil Acre, PO Box 834	√
378	Viburnum					Harrisons Trees	Palmerston Nth	RD1	
379	Vitis		4		C	C & J Nicholls	Tauranga	Pyes Pa Road, RD 3.	
380	Wachendorfia					Bill Dijk	Tauranga	Daffodil Acre, PO Box 834	√
381	Watsonia					Bill Dijk	Tauranga	Daffodil Acre, PO Box 834	√
382	Watsonia		10+	30-40	P/H	T. Hatch	Pukekohe East	RD2	x
383	Weigela				P/H/Cp	Auckland Bot Gdn	Auckland	Hill Road, Manurewa	x
384	Weigela					Harrisons Trees	Palmerston Nth	RD1	
385	Wisteria		5	22	C	C & J Nicholls	Tauranga	Pyes Pa Road, RD 3.	
386	Wisteria					Harrisons Trees	Palmerston Nth	RD1	
387	Wisteria		4	27	C/Cp	T.C.Davies	Inglewood	Lincoln Road	
388	Yucca		16			Martin Walker	Port Charles	Moehau Community, RD, Coromdl.	√
389	Zantedeschia					John Weymouth	Maungaturoto	Pukekaroro Gardens, PO Box 63	x
390	Zephyranthes					Bill Dijk	Tauranga	Daffodil Acre, PO Box 834	√

Theme Collections

1	Alpine Compositae					Univ of Canterbury	Christchurch	Christchurch 1	x
2	Alpine Plants					Timaru Bot Gdns	Timaru	2, King George Place,	√
3	Alpine Plants [contact]					NZ Alpine Gardn Soc	Christchurch	PO Box 2984	x
4	Arboretum		c200		P/H	C.E.Ecroyd	Rotorua		x

New Zealand Plant Collections No. 3, 1 March 1993, continued

No	Collection	Gen	Spp	Cvs	Records	Holder	Town	Address	AI S
5	Arboretum					Cross Hills Gardens	Kimbolton	State Highway 54, Manawatu	√
6	Arboretum				P/Cp	Eastwoodhill Arbor.	Ngatapa	Gisborne	√
7	Arboretum					Eric Appleton	Nelson	Appleton's Nurseries	
8	Arboretum		c542		P/H	FRI	Rotorua	P Bag, 3020	√
9	Arboretum				P	K.R.W.Hammett	Auckland	488c, Don Buck Rd, Massey, Ak 8	√
10	Arboretum				P/H/Cp	Massey Univ	Palmerston Nth	PB	x
11	Arboretum				C/H	Momona Airport	Dunedin		√
12	Australian Flora					Timaru Bot Gdns	Timaru	2, King George Place,	√
13	Bamboos					John Isaachsen	Auckland	83, West Coast Road, Oratia	x
14	Bonsai					R. Langholm	Auckland	41, Taumata Rd, Sandringham	x
15	Bromeliad Collection			99	H/Cp	Auckland Domain	Auckland	PO Box 7107, Wellesley St.	√
16	Bulbs					Bill Dijk	Tauranga	Daffodil Acre, PO Box 834	√
17	Bulbs and Perennials				P/H/Cp	Massey Univ	Palmerston Nth	PB	x
18	Cacti					S. Miehe	Rotorua	PO Box 228	x
19	Cacti & Succulents					Martin Walker	Port Charles	Moehau Community, RD, Coromdl.	√
20	Canary Island Flora					Timaru Bot Gdns	Timaru	2, King George Place,	√
21	Climbing Plants			c400	C	C & J Nicholls	Tauranga	Pyes Pa Road, RD 3.	
22	Conifers					Dennis Schwarz	Wanaka	Box 216	x
23	Conifers					Timaru Bot Gdns	Timaru	2, King George Place,	√
24	Cycad Collection		14		H/Cp	Auckland Domain	Auckland	PO Box 7107, Wellesley St.	√
25	Cycad Collection				C/H	D. Endt	Oratia	108 Parker Rd, Ak 7	√
26	Cycads	8	37	19		New Plymouth DC	New Plymouth	Liardet Street, Private Bag	x
27	Dwarf Conifers			c400	C/Cp	Waitomo District Cn	Te Kuiti	PO Box 404,	√
28	Dye Plants [2]				P/H	E. Cadzow	Wakari	50, Greenhill Ave	√
29	Early Exotics						Kawau Island		
30	Endangered NZ Natives		33		C/H/Cp	DOC	Taupo	Native Plant Nursery, PO Box 437	√
31	Endangered NZ Natives								
		c32			P	Dr Hamilton	Warkworth	Hamilton's Rd, RD2	√
32	Endangered Plants					Timaru Bot Gdns	Timaru	2, King George Place,	√
33	Endangered Plants					Univ of Canterbury	Christchurch	Christchurch 1	x
34	Evergreen Azaleas		5	92+		New Plymouth DC	New Plymouth	Liardet Street, Private Bag	x
35	Exotic Ferns	47	120+	10		New Plymouth DC	New Plymouth	Liardet Street, Private Bag	x
36	Ferns					Sandra Vandermast	Whenuapai		
37	Ferns					Timaru Bot Gdns	Timaru	2, King George Place,	√
38	Forage Plants	285	1480	61000	C/Cp	Pastoral CRI	Palmerston Nth	NZ Forage Germplasm Centre	
39	General Collection(s)				P/H	Invercargill Pks	Invercargill	Parks Div, ICC, PB	x
40	General Collection(s)				P/H/Cp	Pukekura Park	New Plymouth	Liardet St, PB	x
41	Geographic Collections				C/Cp	Univ of Auckland	Auckland	PB	x
42	Heritage Roses					H & I. Gear	Hamilton		
43	Insectivorous Plants				C/H	Heather Frederick	Auckland	43, Endeavour St, Blockhouse Bay	x
44	Iris Internat. cvs Historic Sig					Maria Fairburn	Featherston	PO Box 28, Rimutaka Hill Rd.	x
45	Iris NZ cultivars Historic Sig					Maria Fairburn	Featherston	PO Box 28, Rimutaka Hill Rd.	x
46	Leguminosae					Timaru Bot Gdns	Timaru	2, King George Place,	√
47	Medicinal Plants				C/Cp	Univ of Auckland	Auckland	PB	x
48	NZ Native Ferns					Mrs A. Lau	Paraparaumu	Main Road north.	√
49	NZ Native Ferns	38	111+			New Plymouth DC	New Plymouth	Liardet Street, Private Bag	x
50	NZ Native Ferns		85			Whangarei Dist Cnc	Whangarei	PB 9023	√
51	NZ Natives					Ann Burton	Cambridge	Annton Nursery	x
52	NZ Natives					Arthur Farnell Coll	Auckland	Middlemore Hospital	x
53	NZ Natives					Auck Reg Council	Auckland	Mt Smart Stadium	x

New Zealand Plant Collections No. 3, 1 March 1993, continued

No	Collection	Gen	Spp	Cvs	Records	Holder	Town	Address	AI S
54	NZ Natives					Barriball/Williams	Okato	"Hikurangi", Newall Rd, RD 37	√
55	NZ Natives					Cheeseman Collection	Christchurch		
56	NZ Natives					D. Keir	Granity	PO Box 10, Buller	x
57	NZ Natives		c350		C/H/Cp	DOC	Taupo	Native Plant Nursery, PO Box 437	√
58	NZ Natives					DOC	Offshore	Tiritiri Matangi Is	x
59	NZ Natives					Graeme Platt	Albany	Albany Highway, RD 4	x
60	NZ Natives				P/H	Hukutaia Domain	Opotiki	54, Woodlands Road	√
61	NZ Natives	Many			C/Cp	Landcare	Lincoln	PB ChCh	x
62	NZ Natives					Muriel Fisher	Glenfield		
63	NZ Natives					New Plymouth DC	New Plymouth	Liardet Street, Private Bag	x
64	NZ Natives					Omahanui Nat Plts	Tauranga	Oropi Road, RD3	√
65	NZ Natives					Oratia Native Pl Nurs	Auckland	625, West Coast Road, Oratia	√
66	NZ Natives				C/H	Otari Native Bot Gdn	Wellington	WCC, P&R, PO Box 2199	√
67	NZ Natives		10			T. Courtney	Manurewa	7, Greenmeadows Ave	x
68	NZ Natives					Timaru Bot Gdns	Timaru	2, King George Place,	√
69	NZ Natives (Divaricating)						Auckland	St Heliers Bay Rd.	
70	NZ Offshore Island Plants					Timaru Bot Gdns	Timaru	2, King George Place,	√
71	NZ Offshore Island Plants				C/Cp	Univ of Auckland	Auckland	PB	x
72	Orchid Collection		91	150	H/Cp	Auckland Domain	Auckland	PO Box 7107, Wellesley St.	√
73	Orchid Collection	132	520+	980+		New Plymouth DC	New Plymouth	Liardet Street, Private Bag	x
74	Orchid Collection					Timaru Bot Gdns	Timaru	2, King George Place,	√
75	Ornamental Conifers					D & N. Sampson	New Plymouth	Cedar Lodge	
76	Palm Collection		44	3	H/Cp	Auckland Domain	Auckland	PO Box 7107, Wellesley St.	√
77	Palm Collection					Bason Botanical Res	Wanganui	Rapanui Rd, RD 4.	x
78	Palm Collection				C/H	D. Endt	Oratia	108 Parker Rd, Ak 7	√
79	Palm Collection	20	36	4		New Plymouth DC	New Plymouth	Liardet Street, Private Bag	x
80	Palm Collection					Palm Society	Auckland	Alberon Park, Parnell	x
81	Period plants [1840-1880]		100		C/H	Colonial Village	Howick	84, Pakuranga Rd, Pakuranga, Ak	x
82	Proteaceae					Les Matthews	Akaroa	French Farm, RD.	
83	Proteaceae					Timaru Bot Gdns	Timaru	2, King George Place,	√
84	Rose Collections				P/H	Invercargill Pks	Invercargill	Parks Div, ICC, PB	x
85	Roses					Timaru Bot Gdns	Timaru	2, King George Place,	√
86	Soil Conservation Collection								
		50	600	1800		Landcare	Aokautere		
87	South American Plants					Dr Stephan Halloy	Mosgiel		
88	Subtropical Fruits				P/H	D. Endt	Oratia	108 Parker Rd, Ak 7	x
89	Subtropical Fruits					Dr. Phil Gardner	Opuia	Avenue Nurseries	x
90	Taranaki Trees					Supplementary List	G. Fuller	6, Torbay Street, New Plymouth	√
91	Themed Gardens					Geof Etherington	Nelson		
92	Three Kings Natives								
		c9			C/H	G. Baylis	Dunedin	367, High Street	x
93	Water Plants					H & I. Gear	Hamilton		
94	Waterlilies					Wirihana Tropicals	Frankton	Lindsay Road, RD 9.	x
95	Winter Flowering Plants					Timaru Bot Gdns	Timaru	2, King George Place,	√
96	Woodland Plants					Winifred Huggins Col	Auckland	Mt Wellington	x
97	Woody species				P/H/Cp	Massey Univ	Palmerston Nth	PB	x

