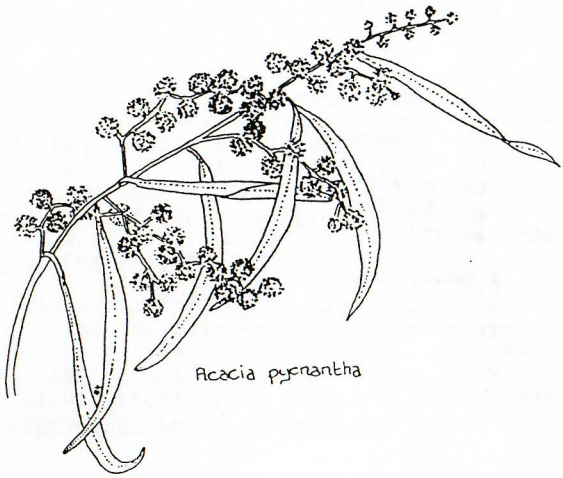
AUSTRALASIAN PLANT SOCIETY NEWSLETTER



ISSUE 11 NOVEMBER 1993

AUSTRALASIAN PLANT SOCIETY

Newsletter No. 11

November 1993

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EDITORIAL

Despite the cool, wet summer, I've enjoyed pottering about my new garden discovering its delights. Not that there are many, considering the property is 17 years old. Apart from three mature holly bushes, and a Victoria Plum tree, which supplied us with pounds of fruit even though its trunk is hollow, there was nothing worth keeping. The original owner was a great cultivator of vegetables and annuals, so you can imagine the empty borders that I am having to slowly plant up. Many of the annuals which I sowed to fill these borders, shrivelled up and died during those hard frosts in mid October when the night temperature dropped to -6°C. Plants of Prostanthera rotundifolia growing in tubs were also blackened. Those Australasian plants brought with me from my previous garden have been planted in the southfacing border against the house wall, where despite the cold frosty weather, Pittosporum tenuifolium is flowering for the second time this year.

To encourage wildlife [not that we need to!], we constructed a pond. Within days, even before we'd acquired any water plants, we had beetles swimming around. In August/September, a pair of dragonflies arrived and spent many a day hovering over the water. Birds bathing in the shallow end include a family of goldfinches, pied and grey wagtails, linnets, robins, and a pheasant. Summer evenings saw house martins and swallows skimming the surface and catching insects. Other garden visitors include a fox, which sat yapping outside the window, and squirrels rolling pears, picked from a neighbouring tree, down the roof above the bedroom in the early hours, in an attempt to eat them!

APS MEETING

There will be no APS meeting this year. There will be a joint meeting with and at Ness Gardens on January 16th 1994 at 2pm. Professor Peter Bannister of Otago University will talk about New Zealand plants. He will give another different, lecture to the APS in London in 1994. Details of that will be given in our April 1994 Newsletter. Early June is the most likely time.

TREASURER'S REPORT

Enclosed is a copy of the treasurer's report detailing our current financial situation. Please make a note on your calendar that membership subscriptions are due on January 1st 1994. The cost remains at £5.00.

NEWSLETTER ARTICLES

Many thanks to all members who sent in information for this issue. Of particular interest is personal experience of growing plants, especially their hardiness. Considering we have over 70 members, I only receive a handful of letters with this information. Please find time to jot down a few lines over winter, and send to me for our April issue.

Sue Hyams

CHELSEA FLOWER SHOW 1994

One of the stands at next year's Chelsea Show will be an exhibit purely of Australian Native Plants, designed and planned by Landplan Studio, the Australian landscape architects responsible for the exhibits of Australian plants at Liverpool International Garden Festival 1983, as well as the World Expo 1988 in Brisbane and the International Garden & Greenery Expo in Osaka 1990. Selected plant material will be transported from Australia but flowering specimens are limited as May is the Australian autumn. If anyone thinks they may have suitable plants in flower at Chelsea time, that they would be willing to lend to the exhibit, would they please contact Jeff Irons.

SOUTHERN ALPINES 1996

The date has been fixed as 5th-10th January 1996, and the venue will be Christchurch, New Zealand. There will be 2½ days of field trips. There will be a short pre-conference tour in the Nelson Mountains and a longer post-conference tour to the southern part of the South Island of New Zealand.

Final conference information will be sent out by July or August 1994.

ALLAN CUNNINGHAM

Allan Cunningham was born in England in 1791. He was to become one of Australia's foremost botanist-explorers, although he originally started his adult life as a law student. Quickly becoming bored with his studies, he started looking for another way to earn his living. He took a job at Kew Gardens where he helped to catalogue all the plants there. This was when he became greatly interested in plants. In 1814, under the direction of Sir Joseph Banks, Cunningham was appointed as a botanical collector at £180 per year. After a successful excursion to Brazil he was sent to New South Wales and arrived in Sydney in December 1816.

During his 17 years in Australia, Cunningham was responsible for collecting more than 3000 specimens of plants and exploring much of New South Wales, southern Queensland and Tasmania. Soon after arriving in Australia, he joined an expedition led by Lieutenant John Oxley, the Surveyor General, into the Blue Mountains where he collected persoonias, chloranthus, boronia, grevilleas and eucalypts. Between 1818 and 1822 he visited a number of coastal parts of Western Australia, accompanying Lieutenant Phillip Parker King in HMS Mermaid. Live collections of plants, bulbs and seeds were shipped to Kew Gardens where Banks eagerly examined them accompanied by the Superintendent of the Gardens, William T. Aiton.

Although employed as a botanist, Cunningham was very much a man of science and kept detailed journals of everyday happenings. He described the areas visited meticulously, so well in fact that it is possible today to retrace his steps and discover again what he found. He described the topography of the area, animals seen, as well as details of the Aborigines including their language and construction

style of their huts. On a visit to Careening Bay, near Port Nelson, in 1820, a large boab tree [Adansonia gregori] was inscribed 'HMS Mermaid 1820.' Cunningham recorded its girth as 29 feet [8.8 metres]. Today it measures 12.2 metres [40ft] with the inscription still very evident.

In 1831, Cunningham returned to England, where he arrived in ill health. He spent his time arranging his collection of specimens in the herbarium at Kew and preparing papers for publication.

In 1832 he was offered the post of Superintendent of the Sydney Botanic Gardens but he declined it. He recommended his brother Richard who took up the position in January 1833.

In April 1835 Richard was killed by some unfriendly Aboriginals, after losing his bearings while plant collecting. Allan Cunningham took over his brother's post, hoping the warmer climate would improve his declining health. He commenced duties in March 1837 but quickly became disenchanted with the gardens, which seemed to him little more than a public pleasure ground. He also objected to growing vegetables for the Governor's table. In late 1837 he resigned and left for New Zealand to continue his own biological investigations.

In October 1838 Cunningham returned to Sydney in extreme ill-health. On 27 June 1839 Allan Cunningham died at the age of 48. In 1844 an obelisk to his memory was erected in the Sydney Botanic Gardens. In 1901 Cunningham's remains were placed in this obelisk and a grove of bangalow palms Archontophoenix cunninghamiana was planted nearby.

His name lives on in various place names and botanical names; eg:

Bachelors Buttons	Gomphrena cunninghamii
River She-Oak	Casuarina cunninghamiana
Swamp Daisy	Actinodium cunninghamii
Albany Woollybush	Adenanthos cunninghamii
Coast Angianthus	Angianthus cunninghamii
Green Bird Flower	Crotolaria cunninghamii
Point Cunningham	Western Australia
Cunningham	New South Wales
Cunningham Gap	Queensland

CORRECTIONS TO ISSUE 10

P.3 2nd paragraph ...wonders whether plants may be self infertile....
P.27 para 3, line 3 Change difficult to will.
P.35 ANISOTOME

AWARD OF MERIT 1991-1992

Celmisia allanii, exhibited by Mrs P A Titleboam, Burwash, E. Sussex. This is an evergreen perennial with a terminal rosette and several leafy, axillary, spreading stems with loose rosettes of elliptic leaves, approx 60 x 20mm [2.3 x 0.8in], obtuse at apex, shallowly toothed, grey-green above with numerous, appressed silky hairs, densely grey white hairy below.

GRISELINIA LITTORALIS

Jeff Irons

Well known in seaside areas, Griselinia littoralis is perhaps used most spectacularly for the 5.5m [18ft] high hedge in the Talbot Botanic Garden, Dublin.

The specific name indicates that the species was first noticed by the sea shore. It is misleading because the occurrence is not only there, but also at heights of up to 1000m [3300ft]. Selected provenances could be much hardier in Britain than is generally thought. Brian Halliwell recalls that when he was an apprentice at Halifax it was used for hedging. Winters then were generally colder than now, yet the species was fully hardy, and was never damaged by cold. On the other hand it was damaged regularly in mild gardens to the west of Glasgow. It may be that there are different clones in British cultivation, or it may be that the cycle of warm and cold spells in the west encourages soft growth and subsequent damage more than the regular cold of Yorkshire.

The common name in New Zealand is 'Broadleaf', and is a reference to the large leaves. They can be up to 11cm long by 9cm wide [4.3" x 3.5"]. The leaf colour can vary from greyish green, through green to quite a yellowish green. This is another of the dioecious New Zealand species. A single plant in a garden will never give seed.

Griselinia littoralis is very variable, and most gardeners will want to grow one of the many variegated forms. The basic one is "Variegata". It really is variegated. Although the basic leaf colour is apple green with creamy yellow markings, individual leaves vary considerably in the amount of variegation. Some are mainly green, with a few 'splashes' of pale colour, others can be entirely yellow, and there are all kinds of variation in between.

A number of other named variegated forms is available. The 1993/4 Plantfinder lists Bantry Bay, Dixon's Cream, Green Jewel, and Milkmaid. At least one of these, "Dixon's Cream" [double quotes because we believe it to be unregistered] originated as a sport on

"Variegata". The name indicates that it originated in the Jersey garden of Mr. W.S. Dixon. The leaves have a yellowish green margin, with only small areas of pure green. The leaf centres are blotched heavily with creamy yellow. The form is recorded as occurring naturally in New Zealand. Green Jewel was named for several specimens growing in Christchurch Botanic Gardens. The original plants were variegated with two shades of green, there being no creamy colouration at all. When propagated their offspring produced leaves variegated with creamy yellow. I do not know this cv., but in New Zealand it is recorded as being yellowish green in a shady situation, but having the creamy markings when grown in open situations. Another cultivar is "Brodick". One year there was a display of plants from Brodick in the RHS Hall. From the display Brian Halliwell obtained material with the variation in the centre of the leaf. With Brodick's approval he named it "Brodick". "Brodick Gold" has the same description, so is possibly the same plant. Unlike most of the other named cvs. "Brodick" does not revert, specimens at Kew were no more than a metre [3.3ft] high after 15 years. Bantry Bay is similar to "Brodick", in that the colouration is in the centre of the leaf. Like it, it is slow growing. My own specimen is stable, but Brian Halliwell has found that it can revert. The story of this cv. can be found in Charles Nelson's book "100 Irish Plants" [Boethius Press].

In my own garden Variegata is about a metre [3.3ft] high, and almost as much across after 10 years. The plant is flame shaped. Bantry Bay is half that size. Both were planted to give winter brightness. Although it receives no sun for the winter six months, Variegata lightens a N.W. facing border. Bantry Bay faces S.W. and does get winter sun.

Griselinia is evergreen and stands hard pruning and shearing. It will grow on alkaline soil and withstand salt spray. Though most common in coastal areas, it is worth trying as a hedging plant in colder areas. The variegated forms are ideal for small gardens.

Formerly in Cornaceae, the eight species of Griselinia have now been put into a separate genus, the Griseliniaceae, named after the Italian Griselini. New Zealand has but two of the species. Brian Halliwell has commented that G. littoralis is the only plant known to him in

which the growth buds do not appear in leaf axils. They are interaxillary.

I have found that cuttings taken in February and March root easily. Since that time suits, I have not tried propagation at other times of the year.

Mail Order Source : Ballalheannagh Gardens, Glen Roy, Lonan, I.O.Man.

SOME WATTLES I'VE GROWN

by Ken Beckett

Although distributed worldwide in warm temperate and tropical zones, well over 50% of the estimated 1200 species of Acacia are found only in Australia. Popularly known in that country as wattles, they are found in most land habitats except the truly alpine, varying from prostrate shrubs to tall trees. In the structure of its seed pods, Acacia is a typical member of the legume family Leguminosae [or if you favour the modern approach, Fabaceae]. Acacia flowers, however, do not conform to the usual pea-shape. Indeed, standard, wing and keel petals are reduced to five minute undifferentiated petals and the whole flower is small and insignificant. But this is where the legumes mimic the composites, for many tiny flowers are densely grouped into globules or rod-like spikes which in turn may be in clusters. This very distinct floral structure has led some botanists to give them a family of their own, the Mimosacae. Fortunately this has never been generally accepted, though Acacia is a main member of the Mimosoidae, a division within Leguminosae.

Outside Australia, most acacias have pinnate to bipinnate foliage, sometimes elegantly fern-like. The Australian A. dealbata, baileyana and others are also of this form, but the majority of wattles have given up leaves in favour of phyllodes. Botanically a phyllode is a modified leaf stalk, often so expanded and flattened as to look just like a true leaf. What the advantage of a leaf-like phyllode is over a true leaf is not easy to see. The general explanation is that the often rather leathery phyllodes are more drought resistant than true leaves and this must be so. However, some species with pinnate leaves grow in the same arid areas as those with phyllodes and thrive just as well. Whatever the reason, phyllody, as this phenomenon is known, has evolved to a fascinating complexity. Among the many species there are phyllodes of all sizes in shapes which resemble needles, awls, spines, scales, paddles, lance-heads, boat-rudders and yacht centre-boards. They may be well-spaced out along the stems or densely borne, sometimes in clusters or whorls. They come in a great range of green and grey and in some species the young phyllodes can be red or purple flushed in a most striking way.

Floral pompons or spikes usually arise in the phyllode axils, either solitarily or in clusters. Less commonly they are carried in terminal panicles. Shades of yellow is the acacia stock in trade as a flower colour with more rarely cream or white. There is at least one excep-

tion to this rule in A. purpureopetala, but the mauve to purple pom-pons are not very showy. Acacia seed pods vary much in size and shape but are basically cylindrical to much flattened with several very hard black seeds. When young, the pods of some species are red or purple flushed. The seeds of certain species are edible when ground up and were used by the aborigines as a food source. Wattles also have other uses, notably as timber, tanbark, firewood and for dyeing. Some species are also good bee plants.

Many wattles are showy in bloom and or provide pleasing forms and textures. Also the intriguingly shaped phyllodes of some have decidedly architectural qualities. Surprisingly then that so few are well known in the British Isles despite the millions of greenhouses up and down the land. Furthermore, the late winter to spring blooming season, minimal heating requirements and adaptability to pot culture makes them ideal candidates for the cold or just heated greenhouse or conservatory.

Over the years I have sown seed of almost sixty species of Australian acacias and still grow plants of more than forty, most of which have flowered in two to four years from sowing. A John Innes No.3 compost is used mixed with extra grit or perlite and this seems to be suitable for all those raised to flowering, though some species thrive better than others.

Although quite a number of acacias can be rooted from late summer cuttings, seed is the usual means of increase. In my experience seed will either not germinate, or only poorly and erratically without heat treatment. This mimics a bush fire which triggers off germination in the wild, and is easy to do. Place the seeds in a small teacup or average sized yoghurt pot and fill to near the rim with freshly boiling water. Leave to cool and for 12 hours. At the end of this period, some seeds will have swelled up to twice as large as the others. Sow the swollen seeds and keep at a temperature not less than 18°C and ideally at 20-24°C. Germination time varies with the species and can range from four days to four weeks. Seeds which have not plumped up can be heat treated again and for several times more if need be.

All seedlings begin with pinnate or bipinnate leaves but those of species with phyllodes soon change over to those curiously modified leaf stalks. Usually the young plants are around 10-15cm [4-6"] tall or a bit more when the phyl-



Acacia seedlings, showing the development of phyllodes replacing true leaves

lodes appear, but there are noteworthy exceptions; A. rubida for example, can be 2m [6.6ft] in height before this happens.

Species I have enjoyed

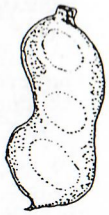
The following notes cover species that have appealed to me for their foliage and or display of blossom and ease of culture. All will stand temperatures down to freezing point.

Intensely blue-grey foliage of fern-like delicacy and an arching habit of growth is the hallmark of A. baileyana the Cootamundra wattle. It is probably the best known species in British cool greenhouses where it will stand light frost in winter and needs minimal heat. The rich, bright yellow floral pompons are freely borne in axillary racemes up to 10cm [4"] long, usually in late winter and early spring. It is best grown in a tub to curtail its great vigour. A. b. 'Purpurea' has the young growth flushed purple and comes at least partially true from seed. 'Aurea' has yellow young growth but I have not grown this and am not sure if it is in cultivation in Britain, the same goes for a low growing cultivar reported as being grown in Australia.

Sold in florists during the winter as "mimosa", A. dealbata the silver wattle, is probably the best known and certainly the most widely seen of all the Australian wattles. It has silvery leaves, even more fern-like and larger than those of A. baileyana and the yellow pompons are carried in terminal panicles. Unfortunately it is very fast growing and sets out to become a 30m [100ft] tall tree as soon as possible. Only its frost tenderness prevents this from happening except in very favoured frost-free climates. It is not a plant for the small garden and does not give of its best cramped in a tub.



Although varying greatly in size, lanceolate to narrowly oblong is the commonest phyllode shape amongst acacia species. A favourite in this category is A. fimbriata, the so-called fringed or Brisbane wattle. A large shrub or small tree in the wild, it has slender arching stems and willow-like phyllodes to about 5cm [2"] long fringed with tiny hairs. Globular flower-heads open in axillary racemes in late winter, often in abundance. My plant has primrose yellow flowers but darker forms are equally common in the wild. It will stand regular pruning and short term light frost.

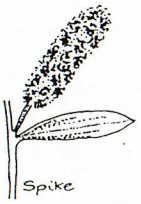


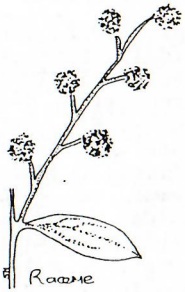
Types of Acacia pods

More robust and with phyllodes 7-15cm [2.75-6"] long is the Sydney golden or sallow wattle, A. longifolia. In the mild climate of the southwest and particularly in the Isles of Scilly, it makes a magnificent garden specimen when smothered with bright yellow bottlebrush-like spikes in spring. Fairly hard pruning and tub culture is tolerated.

In the same category is A. retinodes, the swamp silver or Wirilda

wattle of Tasmania, South Australia and Victoria, but the even longer phyllodes are bluish-green and the overall habit more graceful, often with pendulous branchlets. The floral pompons are bright pale yellow in short axillary racemes. Also with slender phyllodes 10-20cm [4-8"] long is A. rubida, sometimes known as red-stemmed wattle though this character does not show very strongly on my plant. [Partially shaded greenhouses are not conducive to anthocyanin production in stems and leaves]. As mentioned above, this species has a delayed juvenile phase and can be 1.5-2m [5-6.6ft] tall before the phyllodes appear. Though a large shrub in the wild, it does well in a large pot or tub and stands quite hard pruning [which can stimulate another temporary flush of juvenile bipinnate leaves]. Bright medium to light yellow globular flowerheads open in axillary racemes during the late winter. Slender stemmed and with phyllodes only 2-5cm [0.8-2.00"] long is the bramble or elegant wattle, A. victoriae, also known as gundabluey in Australia. It is a variable species with spiny and spineless, glaucous and green phylloded forms. The floral pompons can also vary from cream to yellow. In its various forms it ranges across Australia, though originally named for the Victoria River in central Queensland [now renamed the Barcoo]. I grow two variants, one with stipule spines and grey-green phyllodes, the other spineless with deep green phyllodes and clearer yellow flowers. The latter is sometimes grown as A. sentis, a name now reduced to synonymy, but representing a very distinct plant. It roots readily from cuttings and flowers when small, making an excellent pot plant.





Inflorescence

Spiny and non-spiny forms are also found in the very different A. paradoxa still better known in the British Isles as A. armata and in its homeland as kangaroo or hedge wattle. It has erect, lanceolate to oblong phyllodes which are often wavy along the outer edge and 1-3cm [0.4-1.2"] long. Although borne solitarily, the globular, bright rich yellow flowerheads appear in every phyllode axil on right-angling peduncles well clear of the foliage. For many years this has been a popular wattle in British greenhouses, though less now than formerly, and represented by a spineless clone easily rooted from cuttings and blooming when young. It grows wild throughout Australia and southern forms will stand some light frost. It has the propensities of a pest on waste and open ground in its homeland and in Victoria has been declared a noxious weed.

Ovate to triangular phyllodes are also commonly met with in Acacia, including some attractive species. A favourite of mine is A. celastrifolia, the aptly named glowing wattle of Western Australia. With me it branches rather sparingly and has a loose, wand-like habit. In the wild, however, it is apparently freely branching. The 3-9cm [1.2-3.5"] long phyllodes are broadly elliptic to ovate with a short slender point and can be green to grey-green [mine the latter]. Loose axillary racemes to 15cm [6"] long bear luminous yellow pompons from distinctively dark buds, a charming contrast. This fast growing

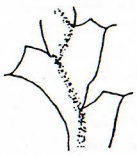
species can bloom in two to three years from seed and deserves to be grown more often. When not in bloom, few people guess it to be an acacia.

Another charmer is A. podalyrifolia, known in its homeland both as Queensland silver wattle and Mount Morgan wattle. A large shrub to small tree, but easily kept to size in a tub, it has silvery silky-downy phyllodes ranging from oblong to ovate and 2-4cm [0.8-1.5"] long. A well grown specimen is worth having for its foliage alone, but there is a bonus in its rich, bright yellow pompons in axillary and terminal racemes.

Very different is A. glandulicarpa, a rounded bushy species with the rather uninspiring vernacular name of hairy-pod wattle. The stems are more-or-less sticky when young and the forward pointing, deep green phyllodes are only 1-1.5cm [0.4-0.6"] long. Rich yellow, globular flower heads appear solitarily or in pairs at the phyllode axils. Fairly slow growing for an acacia and freely blooming, it makes a good container specimen. In the wild it is restricted to the Dimboola to Jallumba region of Victoria.

Although several wattles are hairy, only A. vestita is known as hairy wattle. This has a pendulous mode of growth right from its first year of life and builds up height gradually. In its native New South Wales it can eventually exceeds 3m [10ft], but must take many years to do so. The phyllodes are 1-2cm [0.4-0.8"] long, oval to elliptic, softly hairy grey-green and densely borne. Globular deep yellow flowerheads are borne in racemes exceeding the phyllodes. An ideal species for containers but rather prone to attack by glasshouse red spider mite.

Next to A. dealbata and A. baileyana, A. pravissima must be the most widely grown acacia. Known as Oven's wattle, this native of north-eastern Victoria and adjacent New South Wales eventually forms a small tree with slender pendulous branchlets. The thickly borne, 5-20mm [0.2-0.8"] long, lop-sidedly triangular, grey-green leaves are set parallel to the stems and create a distinctive and attractive foliage effect. In late winter to spring, every twig is festooned with racemes of bright rich yellow pompons and the whole plant radiates a golden glow. This is a vigorous moderately hardy species well worth trying outside or on a south facing wall. Under glass it rapidly outgrows a tub and if planted in a border will soon make a takeover bid for all available roof space. Nevertheless, it is a highly ornamental plant and certainly ranks among my five favourite wattles.



Winged stem as Acacia alata

A few acacias not only have phyllodes borne edgeways parallel to the stems, but with the outer margin extending down to the axil of the phyllode beneath. This creates a winged-stem effect unique in appearance. A typical species is A. glaucoptera, the flat or clay wattle. Loosely rounded and spreading and rarely above 1m [3.3ft] in height, it inhabits the coastal barrens area around the Fitzgerald River of Western Australia. New shoots can be flushed or edged purple-red and solitary globular flowerheads to 8mm [0.3"] across open mid to deep yellow. It makes a good, easy going pot plant and a noteworthy talking point.

In many wattles the phyllodes are reduced to needle-like structures of varying lengths and thicknesses. Elegantly decorative is the streaked wattle [a curiously unlovely vernacular name], A. lineata. This native of Queensland to Victoria and South Australia usually grows among mallee eucalypts and has softly white-hairy phyllodes 1.5-2.5cm [0.6-1.0"] long. Mid to deep soft yellow pompons occur singly or in pairs in the axils, often in some abundance. Also graceful and much more pendulous is A. riceana a Tasmanian endemic from damp, somewhat shaded habitats. Although quite widely cultivated in Australia and the British Isles, it seems not to have acquired a common name. The needle-pointed phyllodes are deep green, 1-2cm [0.4-0.8"] or more long and mostly arranged in loose spirals along the stems, sometimes in whorls. Lemon to palest yellow pompons are carried in loose racemes well clear of the foliage.

Stiffer and bushier and with shorter, awl-shaped phyllodes in definite whorls is prickly Moses, A. verticillata. In the wild it inhabits coastal cliffs and open mountainsides, sometimes forming impenetrable thickets. Although unpleasantly prickly, it is an attractive species when garlanded with its 1.5cm [0.6"] long, rod-like spikes of light to medium yellow. There is a variety with longer flower spikes and broader phyllodes [var. latifolia] and a low-growing sprawler bearing very short spikes [var. ovoidea], but I have not been able to obtain seeds of these to try. The rather unusual vernacular name is a corruption of prickly mimosa!

The phyllodes of prickly Moses almost qualify to be described as spine-like, but several acacias are more realistically endowed in this way, though not necessarily more fiercely armed. One such is A. genistifolia, the spreading wattle, a loosely tangled shrub from Tasmania to New South Wales, often in heathland. Lemon yellow to cream pompons appear in small groups or singly from the phyllode axils in late summer and autumn. Although not always very sharply pointed, the phyllodes look like thorn extensions of the stem. Although an intriguing species it has so far proved to be rather shy flowering.

At least one acacia to my knowledge dispenses altogether with phyllodes. This is A. spinescens, the spiny wattle from South Australia, New South Wales and Victoria. It resembles a slender, spiny broom with twiggy green to grey-green stems each one tipped with a prickle or spine [often fairly soft on greenhouse grown specimens]. Sessile, globular, fairly bright rich yellow flower heads appear at each node in later winter to spring. A drought resistant species, spiny wattle has some resistance to frost and might be worth trying outside in a sunny site beneath the overhang of a roof.

AWARD OF MERIT 1991-1992

Celmisia sessiliflora 'Mount Potts', exhibited by Mr & Mrs J I Young, Aberdeen. This is a cushion-forming plant of a grey-green colour. The plant exhibited was 9 x 22cm [0.35 x 0.87"]. The leaves are 5-10mm [0.2-0.4"] long and 2mm [0.08"] wide at the base and tapering to an apex. They are stiff and erect when young, later spreading. Both upper and lower surfaces are covered with closely appressed, fine, silky hairs.

REPORT FROM NICK ANDREWS

A member living in Powys

'Regarding the plants I have grown from last year's seed list. In the autumn I planted out seedlings of Callistemon subulatus and Hovea sp 'R' - despite the prolonged cold spell around Christmas time, both appear fine.

My much cherished Dietes robinsoniana seedlings were given different homes as a precaution - one in the frost-free greenhouse, one on our rather cold and draughty bedroom windowsill, and the other in my parents' "superheated" bungalow - all three thrived and seem very easy to please. I did not find Eremaea violacea so easy - germination was excellent, but they gave up the ghost soon after. I have one Kunzea capitata which survived in the greenhouse, but obviously didn't like the comparatively high humidity level. Melaleuca hypericifolia grew at an amazing rate from such a tiny seed - will I be able to contain it? All the Acacias have survived, though A. wilhelmiana came out in a sort of warty rash towards the end of the summer - I can't work out the cause, but growth does not seem affected. I have several Patersonia fragilis which overwintered, though I lost 2 or 3 through fungus attacks. My Diplarrena latifolia plants are all doing well, though I didn't risk any outside [Ed. Hardy in E. Anglia, stands 6°F] - I also have a nice specimen of Orthrosanthus polystachyus which has beautiful soft blue flowers - again I kept this out of the frost.'

At the end of his report, Nick informs us that he has a seed of the glaucous Australian Cycas sp. [ex Mount Surprise, Qld] from Chilterns, which is in the process of sending out a root. It is in a mix of perlite, charcoal and silversand, as he was advised that they easily rot. Nick asks us for advice on the cultivation of Cycads.

Ed. We think that this is probably Cycas sp. affinity kennedyana - distinguished by its glaucous leaves. Cycads are definitely indoor plants in Britain. Though they will stand some frost, they like it warm, moist, and with some sun. They do not like lime, and must have good drainage. Cycads are slow growing, and may be the oldest living things on earth. They do need plenty of room, for their leaves can be up to 2m [6.6ft] long. Is anyone else growing them?

WINTER REPORT FROM NORTH LEEDS

by Thomas Naylor

Between mid-October 1992 and mid-April 1993 there were 63 air frosts; 29 during December and January. The lowest temperature was -7°C on 3rd January and the longest period of continuous below-zero temperatures lasted for approximately 64 hours around the winter solstice. There were some very strong winds but only three light falls of snow.

Small plants of Acacia mucronata [APS seed - provenance Dazzler Range, Tasmania] and A. pravissima survived unprotected in the open ground. A nearby A. verticillata was cut right back but began to regenerate in May.

An Arthropodium cirrhatum in the open wasn't completely destroyed by

the winter weather though the slugs finished it off in the spring. Arthropodium is the top favourite Australasian plant among the slug population; Clianthus and Swainsona are both highly commended in the estimate of the local tasting panel.

BANKSIAS in pots of peat and grit [mostly very young seedlings] : unprotected.

species	no of plants	survivors
aemula [serratifolia]	2	0
ericifolia	57	8
grandis	1 [3 yr old]	0
integrifolia	25	4
marginata	25	2
oblongifolia [asplenifolia]	60	36
paludosa	70	2
robur	1	0
spinulosa	58	0

Callistemon citrinus and violaceus both survived in the open ground. C. linearis was cut back but regenerated. C. salignus, against a south-facing wall, was killed.

My one unprotected Clianthus puniceus died. Correa reflexa survived with no damage though its attempts to flower in winter proved not very successful and a Sollya heterophylla which was twined around it died. Three other S. heterophylla survived.

The larger of my two Eucalyptus globulus had 80 flowers in July. E. viminalis flowered in September. E. leucoxylon, in a pot of ericaceous compost, managed to just survive the winter. E. paliformis [APS seed] did not suffer any damage. Hakea saligna and Kunzea parvifolia were both undamaged. My two remaining Leptospermum scoparium survived almost unharmed but have still not flowered. A Melaleuca squarrosa, which had been under cover during the previous winter, survived in the open ground with only slight browning of the leaves. M. decussata died with the same treatment.

A HARDINESS REPORT FROM CHESHIRE

by Dr. Tony Entwistle

Following on from Stephen Read's report in the last newsletter on the hardiness of some Australasian plants in Norfolk, we have the following report on Tatton Park, Cheshire [where I have been in charge of the walled garden]. It should be remembered that our last bad winter was 87/88. I have omitted Eucalypts which were dealt with in the last newsletter.

1. Survived without any winter damage over the last 5 years

[a] Australian - all with wall protection

Acacia dealbata, type and subsp. subalpina [both seem the same]. Now 4.5m [15ft] high on wall but yet to flower.

Callistemon subulatus and sieberi

Olearia phlogopappa [white form]

Correa backhousiana

[b] New Zealand - in open except for Pittosporum by wall, all Hebes except speciosa hybrids
Sophora tetraptera 'Gnome'
Hoheria glabrata
Phormium tenax and var. 'Purpureum'
Phormium colensoi 'Cream Delight'
Pittosporum tenuifolium cvs. eg. 'Garnettii', 'Margaret Turnbull'
Cyathodes colensoi
Leptospermum rupestre
Aciphylla squarrosa
Cordyline australis

2. Survived but damaged often severely each winter
Grevillea rosmarinifolia
Acacia retinoides
Hebe speciosa cvs 'La Seduisante' etc

3. Failures, may have survived 1-2 winters but never more
Grevillea sulphurea
Olearia phlogopappa 'Comber's Blue' and 'Comber's Pink'
Telopea truncata [perhaps surprising, but we have also failed with its Chilean counterpart Embothrium lanceolatum]
Dracophyllum longifolium
Clianthus puniceus
Hakea sericea
All other Leptospermum
Solanum laciniatum
Pimelea prostrata
Corokia virgata

NATIVE FUCHSIAS?

by Steve Law

Is anybody into Correas over here?

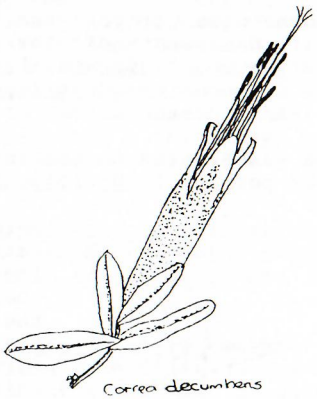
I don't seem to hear much about them but I'm not too surprised. Prior to my trip to Australia, my own impressions included only some tatty looking shrubs unpromisingly dubbed 'Australian Fuchsias'; enough, I suppose to put off most discerning gardeners, including those who actually like fuchsias for whom I'm sure they'd be considered no substitute at all.

In Australia on the other hand, Correas are one of the top genera for landscape and garden. After Acacia, Eucalyptus, Grevillea and Callistemon and alongside Melaleuca, Prostanthera, Banksia etc the next thing you're likely to see is a Correa of one kind or another.

Maria Hitchcock of Armidale, NSW, claims to have seen over 70 varities, cultivars and hybrids although she thinks she'll whittle it down to nearer forty really distinct varities. Correa is a distinctly manageable genus with only eleven species [according to Wrigley & Fagg], so that's not a bad figure even so.

At first glance though, Correas are distinctly easily overlooked by comparison with their flashier compatriots; pleasant but not hugely

striking evergreen shrubs in the 60-120cm [2-4ft] height range with a fair show but rarely a real display of flowers of an unassuming pinkish, greenish or reddish hue.



And yet they have many enthusiasts in Australia. For me, it was just this subtle alure that caught my eye, and made me so keen to get to know them rather than the many other alternatives I could have chosen. So much so that I quickly tired of the more popular pink cultivars, Correa x "Mannii" and C. 'Dusky Bells' and moved on to the wonderfully subtle and textured greens of C. backhousiana, C. lawrenciana and some of the C. reflexa range. At which point I should own up to the fact that many Correas that might prove at all hardy here are likely to have greenish flowers, but that needn't discourage anyone who enjoys Fritillarias, Euphorbias and the like.

Generally speaking, Correas are evergreen shrubs rangeing from the completely prostrate as in C. decumbens to small trees such as a lovely C. lawrenciana I saw in Gippsland, Victoria, 6m [20ft] high with broad 15cm [6"] leaves. Correa foliage is normally smaller, round, oval or oblong, often interestingly textured and frequently covered, especially when new with a brown scurf [stellate hairs, I'm told] which may also cover the stems, calyx and even the corolla, giving the whole shrub an interesting brownish tinge, reminding me of some Eleagnus.

The straggliness associated with Correas is I believe mainly faulty cultivation but also the pervasive influence of C. reflexa which can be terribly gangly and which passes this on to its hybrids. Some forms accentuate this impression by hanging their leaves at an odd angle and so looking permanently wilted. Most Correas have more or less tubular or bell-shaped flowers 25-50mm [1-2"] long with four corolla lobes more or less reflexed at the tips, and eight anthers which may or may not be fused to the corolla. The fruit is also in fours. In Australia, the flowers are mainly produced from April through to September, that is, in the cooler season, stopping when it gets too cold, as they do outside here.

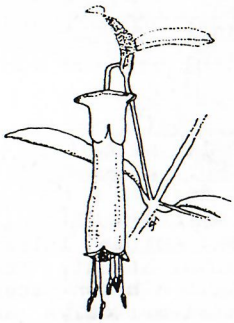
The flowers do vary quite a bit however. C. alba has white or pinkish flowers with the corolla split and reflexed back to the calyx, whilst the flower of C. decumbens scarcely opens at all and stands upright like tiny candles on the prostrate branches. C. pulchella has rich orange flowers and is the other parent of and superior to C. x "Mannii". C. aemula and calycina have lurid green flowers the tube partially split along its length. C. lawrenciana also has some odd pinkish brown forms and may carry its flowers in threes. C. baeuerlenii has a bizarre calyx like a chef's cap or an apple core.

Geographically by far the greatest concentration of Correas appears to be in S. Australia and Victoria with C. schlechtendahlii, pulchella, decumbens, aemula and calycina endemic. C. baeuerlenii is a species from shady forests in NSW. I thought C. backhousiana was a Tasmanian endemic but apparently it occurs in Victoria. C. glabra, alba and

lawrenciana are all variable and widely distributed in S.E. Australia but most widespread and variable by far is C. reflexa, the only Correa to extend into Western Australia, although there is an obscure relative - Nematolepis phebalioides endemic to W.A., differing mainly by having its' floral parts in fives.

Otherwise Correas' taxonomic relations seem a little obscure. Australia has plenty of other Rutaceae including of course Boronia, but also Eriostemon, Crowea, Phebalium, Zieria, Acredenia, some more obscure W.A. endemics, Chorilaena and Diplolaena and some subtropical Australian representatives of the Citrus fraternity.

I understand Correa is variously believed to be closest to Phebalium or perhaps to Diplolaena, but I can't offer an opinion.



Correa baeuerlenii

Correas are very adaptable as to habitat in cultivation, although many show distinct preferences in the wild; C. alba and backhousiana virtually on the beach, baeuerlenii and lawrenciana mostly in the woods, but most Correas grow well alongside the wattles and gums and such like in the all-pervasive dry schlerephyll Australian bush and tolerate poor dry acid soils with the best of them [although their range does not extend far toward 'The Centre'].

Like most Australian plants, Correas are considered calcifuge, but some forms of C. reflexa and pulchella and hence their hybrid C. x "Mannii" grow best apparently on alkaline soils [Wrigley & Fagg]. My general impression of Correas in cultivation in Australia was that they were remarkably adaptable, on several counts [and my experiences now in my own rather dingy garden seem to bear this out]. They were very shade tolerant, often used as an underplanting [although I appreciate that Australian dappled sun under a eucalypt does not approximate to English shade]. They also accepted unpredictable weather very well, all species growing well in Hobart where, as they say you can experience all four seasons in as many hours. C. reflexa, alba, lawrenciana and backhousiana, grow locally there, lawrenciana even under snow on the mountains, backhousiana and alba enduring Antarctic blasts on the coast. Correas are considered reliable in the central midlands of Tasmania where temperatures can drop to -12°C on occasion without the benefit of reliable winter dryness. I certainly did not get the impression that any except possibly C. baeuerlenii were at anything like the limit of their tolerances in Hobart.

Lime tolerance I know less about. I'd not wish my Correas on my chalky soil here in Lewes of course. The water is hard but chlorosis has only been intermittent and probably more due to the shock of moving to the UK. At present they're potted in about 15% grit/15% perlite/70% ground bark mix and fed with Australian-bought osmocote for trees and shrubs. So far I've had remarkably few casualties. Of the 18 or so rooted cuttings I brought here in 1992, both of one variety that were barely rooted quickly expired and I lost one of the two broadleaf lawrencianas this spring after a long degeneration. Otherwise they seemed to settle down extraordinarily quickly and most

have "romped away" as they say, so much so that I've just taken my first crop of cuttings.

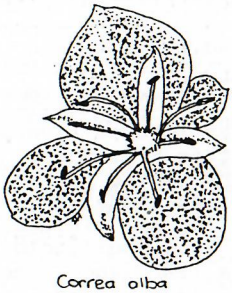
This is in obvious contrast to most of the other species I brought home, many of which are barely hanging on. What is also especially exciting is the appearance of a Correa seedling yesterday. Correa is notoriously difficult from seed, prolonged leaching usually being recommended. This one has come up with just a little bottom heat. It says something of what I expected of my Correa seed that I failed to label it properly so it maybe any one of a number of types.

Finally I'd like to briefly describe a few forms that I think may be especially worthwhile to try outside in the UK, some of which I may be able to provide soon.

Correa reflexa - a remarkably variable species and many good forms are in cultivation in Australia. I have two Tasmanian forms, both green flowered, a gangling one from Ridgeway just west of Hobart, and a smaller, more graceful one from the east coast.

The best by far however is C. reflexa nummulariifolia which comes, I believe, from the Islands of Bass Strait. It is a common landscaping variety in Australia and you see a lot of it about but it is a good one - small, circular, greyish brown scurfy leaves on a dense, low bush. The creamy-greeny flowers have attractive contrasting chocolate anthers and show up well against the foliage.

Correa backhousiana should need no introduction except to say that grown well it is a lovely shrub. Once again, the greeny-creamy flowers look well against the brownish foliage. It is widely regarded as the hardiest. I also have a form identical but for its flowers being tinged reddish pink and is probably a hybrid with C. reflexa, possibly 'Marious Marvel?' [which I recently learned is available wholesale at least from Duncan & Davies in Chichester].



Correa alba

Correa alba should also be well known. I didn't bring any back as I didn't fancy it at the time. It has greyer foliage and of course the unusual flowers. There were however several good hybrids including 'Gwen' [x reflexa with pinkish flowers [some plain C. alba also have pink flowers] and 'Ivory Bells' [x backhousiana] which speaks for itself and I wish I'd brought it with me. All these would probably be good by the sea.

Correa lawrenciana deserves much more attention. It is also very variable in nature and I have two sorts; a tree-like broad-leaved one with green flowers and an altogether smaller form from Mt. Wellington in which the greenish flowers appear dusted with coffee powder!

Finally, I would be glad to hear of any further experience with Correa in this country and of any other forms that may be available, perhaps with a view to setting up a national collection. I hope also to have some rooted cuttings to spare fairly soon if anyone is interested.

SNIPPET - SEED SOWING

In the April Newsletter, an assumption was made that all growers are fully familiar with seed growing techniques. Some may not be. The sphagnum moss mentioned on page 12 should not be live, but has to be dried before seiving. A very readable account is given on page 13 of Brian Halliwell's book 'The Propagation of Alpine Plants and Dwarf Bulbs', Batsford 1992, £17.99.

SNIPPET - CLAY V PLASTIC

Paul Mathews of Liverpool University's Ness Gardens showed Jeff Irons two pans of Ranunculus crithmifolius. Both had stood outside all winter. One, a clay pan, was full of seedlings, the other, a plastic one, was bare. Paul wondered whether the difference was the result of better aeration in the clay pot.

1993 BOTANICAL CONGRESS

At the 1993 Botanical Congress two of the motions approved were : that it will be possible to make a case for the conservation of a species name, and that it will be possible to make a case for the rejection of a name. The effect of these will be that it will be possible to conserve a well known name, even though it is not the historical first one.

NAME CHANGES

Craspedia sp 'B' in Kosciusko Alpine Flora is now believed to represent hybrids of various alpine species.

NEW ZEALAND FLATWORM

Jeff Irons reports that the New Zealand flatworm has reached Liverpool and South Manchester, and is on the Isle of Man. This killer worm is endangering valuable populations of earthworms upon which it preys nightly. During the day it inhabits moist conditions under stones, pots, boxes etc. It is easily recognised, resembling a thin, slimy piece of liver, with a purply-brown upper surface and buff-coloured margins. It grows to about 17cm [7"] long, and is flat and smooth. In spring, its egg capsules are black, shiny and round, like small blackcurrants, found in clusters near the adult worm's habitat. It can be trapped [a] by standing pots on a sand-bed; the worms congregate on the sand, under the pots, or [b] by placing pieces of polythene on the ground under which they also congregate.

SEED LIST DELETIONS

Burtonia conferta,
Flindersia schottiana,
Xanthorrhoea resinosa
Dryandra praemorsa,
Spyrideum cinereum,

LEPTOSPERMUM "NICHOLLSII NANUM"

by Jeff Irons

There is a large number of Leptospermum scoparium cultivars. How does one decide which one to select? Even though the current Plant Finder lists it as being available from only one nursery - MHig - I want to put in some words of praise for Leptospermum scoparium "Nichollsii Nanum". It originated at Ness Gardens in the days when Mr. Hope was Head Gardener, as a seedling from "Nicholsii". The exact time is not known, but the 1930s or 1940s are likely. The c.v. is still grown at Ness, and is said to survive all except the most severe winters. On the other hand some letters published in the Journal of the Royal Horticultural Society report on its hardiness less favourably. What is not in doubt is that it is a fine dwarf cultivar with dark red flowers. Newer selections may be different, but they cannot be better than Leptospermum scoparium "Nicholsii Nanum". Some are no-where near as good.

SNIPPET - ORITES REVOLUTA

One of the unusual items in the 1993 seed list was Orites revoluta. A member of the Proteaceae, it is found as a shrub up to 1m [3.3ft] high on the mountains of Tasmania. Jeff Irons has had a specimen in his garden since 1983, and reports that earlier this year it was 10cm [4"] high. In the excessive wet of May 1993, the specimen made 5cm [2"] of growth. The growth hardened during June, and there was no further extension growth in July's wet weather.

Perhaps the key to good growth is abundant water in spring. In the wild it would then be growing in ground saturated with snow-melt water.

ALPINE GARDEN SOCIETY REPORT

Some antipodean plants were exhibited at the Alpine Garden Society's Wirral Show, which was held in Lancaster.

Leucophyta brownii was shown under its former name of Calocephalus brownii and gained a First Prize. Although in our 1993 seed list, no one requested it. The species makes a low hummock of tangled silvery stems. The small yellow flowers which appear in late summer are of little significance. Ideal for sandy soil, it is not reliably hardy and is best treated as a seed raised annual, or as a tender perennial overwintered by rooted cuttings.

Phormium tenax 'Alpinum Purpureum' was also exhibited. The name Alpinum is somewhat misleading for it grows to around 67cm [2ft] high.

A 1990 seedling of Wahlenbergia saxicola looked attractive. Again, not reliably hardy, this Campanula relative fares best in a moist soil and needs warmth to open its blue flowers. It grows to about 10cm [4"] and is generous with seed.

AUSTRALIAN TERRESTRIAL ORCHIDS

by Tony Entwistle

Of all the plants I saw on my visit to Australia none fascinated me more than the wealth and variety of the terrestrial orchids in the spring.

Most exquisite of all were the 'spider' section of Caladenia. Some of this genus have normal petals, as C. carnea - 'Pink Fingers', but many have very attenuated tails.

The commonest species, from Western Australia through to Tasmania, is C. patersonii, usually white, but around Albany I saw many other rather larger spp in yellow and tawny shades - C. pallida, filamentosa and longiclavata.



Caladenia patersonii

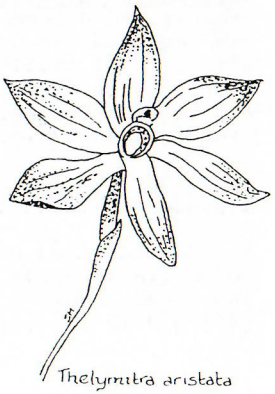
Another beautiful genus is Thelymitra - Sun Orchids - in various colours : blues and 'sunset' shades as well as pink, yellow and spotted.

In Western Australia I saw T. fasciculata [blue], aristata [pink], antennifera [yellow], Macmillanii [salmon] and fuscolutea [spotted].

In the Grampians the Donkey orchids were plentiful, notably Diuris punctata, a spotted yellow.

Pterostylis [Greenhoods] were everywhere, mostly in green and white stripes, rather arum-like, very difficult to identify particular species. Other orchids which were more curious than beautiful were the stout Leek orchids, Prasophyllum and the tiny hooded Corybas in the woods.

Cultivation here has to be in pots in a frost-free greenhouse. Pterostylis is by far the easiest genus and takes readily to pot culture; the new tubers often I find migrate right to the bottom of the pot. The others are very difficult; the tubers are often tiny and rot off in winter, when they need to be on the dry side during dormancy. I use a mixture of equal parts gritty sand, pine needles and fibrous acid loam.



Thelymitra aristata

It is possible to import dormant tubers but they are 6 months out of step with our climate and I have had many failures trying to acclimatise them. I may try importing some flasked seedlings [which do not need Cites permits]. The only source in Britain that I know is Westwood Nursery, Welling, Kent.

PREHISTORY OF NEW ZEALAND Part Three

by Sue Hyams

Part Three in the prehistory of New Zealand describes the changes during the second part of the Tertiary Period [the Neogene] through to present day. As mentioned in the previous issue, the Tertiary Period is characterised by the dominance of mammals in the Animal Kingdom and of Flowering Plants in the Plant Kingdom.

The Neogene is split into the Miocene, 23.7 to 5.3 million years ago, and the Pliocene, from 5.3 to 1.6 mya.

During the Neogene, New Zealand became the North Island and South Island which we know today. Great activity on the Alpine Fault thrust up the alpine mountains which characterise modern New Zealand.

MIOCENE EPOCH 23.7-5.3 million years ago

Throughout the Miocene, land rapidly emerged, so much so that by the end of the epoch, New Zealand's land area was about double what it had been at the start of the Miocene. For the first time since the Late Cretaceous, mountains and hills appeared, and there was volcanic activity.

The Early Miocene vegetation differs from that of the Oligocene in the relatively greater abundance of Podocarp Conifers, Ferns and Palms, and in an increase in the percentage of Nothofagus fusca. Beeches of the Nothofagus brassii group were still the dominant forest trees. The drier conditions of Southland brought about a decrease in Podocarps and Ferns.

Miocene floras in New Zealand include : Cordyline, [Cabbage-trees], Bulbinella [Liliaceae], Potamogeton, Alectryon, [Sapindaceae], Chenopodiaceae, Cornaceae, Dactylanthus of the family Balanophoraceae [in which only one species survives today, confined to New Zealand], Halagoris [of the family Halagoraceae, and a genus which is abundant in modern Australia], Macropiper [of the family Piperaceae, and which grows as an understorey in modern forests], Ixerba [which is an endemic genus of New Zealand today, Pittosporum, Muehlenbergia, Umbelliferae, and Meliclytus.

The families Aquifoliaceae, represented by Ilex Hollies, and Myricaceae become extinct in the Miocene in New Zealand, as do a few others.

The cooler climate of the later Miocene, when the southern ice cap formed, shows a vegetation change. Heath zones appear on the higher ground.

PLIOCENE EPOCH 5.3-1.6 million years ago

During the Early Pliocene, tectonic movements continued and modern New Zealand quickly took shape. The main mountain ranges were formed. South Island was almost its present shape. Parts of the North Island were submerged early in the Pliocene when the southern ice cap started

melting. Subsequent tectonic movements resulted in the seas withdrawing and all the land reappearing. There was extensive volcanic activity.

In the warm interval at the start of the Pliocene Epoch Nothofagus brassii dominated the forests in North Island. In South Island the forests were more mixed with Myrtaceae [Metrosideros fulgens] prominent, along with Dacrydium cupressinum and Nothofagus fusca. Palms and Tree-ferns were more abundant then.

In the cold, dry climate about 3 million years ago, lowland vegetation was grassland with abundant Asteraceae, Umbelliferae, Euphrasia [Scropulariaceae], and Cyperaceae. Many different sorts of plant communities were evolving.

The Late Pliocene was the last time when Nothofagus brassii was to be prominent. Its importance declined with the ice age, presumably because of the fluctuations between arid and wet climates. Myrtaceae took over the dominant role.

Under the ice age conditions many of the warm-temperate taxa disappeared. They had nowhere to flee to in the small, isolated island, unlike in Australia where plants had room to move and find their preferred conditions as climatic change affected them. Those plants which did not survive beyond the Pliocene in New Zealand include Bombax [Baobab family], various members of the Proteaceae, Ephedra, Zygogynum [Winteraceae], and two species of Cupania. To take their place, Acacia became abundant in arid coastal sites. Open heath vegetation included Pimelia [Thymeleaceae], Portulacaceae, Epilobium [Onagraceae], Colobanthus [Caryophyllaceae], Wahlenbergia [Campanulaceae], Arthropodium [Liliaceae], Gentiana and Hebe.

THE QUATERNARY PERIOD

The Quaternary Period covers the last 1.6 million years. It is divided into the Pleistocene Epoch which was characterised by the repeated glaciations of an ice age, and the Holocene Epoch which represents the last 10,000 years since the retreat of the most recent ice sheets in the Northern Hemisphere.

The main direct effects of the ice age were felt in the Northern Hemisphere where land is closely gathered around the North Pole. The northern ice cap was up to 3km [1.8 miles] thick in parts. Ice covered Canada and extended down to New York and down to the Rockies. It covered Germany, northern Russia, spread over Scandanavia to Britain and froze over the region where London is now. The North Atlantic became an Arctic Sea, frozen between Greenland and Britain.

By comparison with the Northern Hemisphere, southern lands were much less affected by the ice age. Australia, being tectonically stable, was little affected by glaciation. In contrast, New Zealand suffered partial submersion, dramatic mountain building, volcanoes, earthquakes, and also widespread and severe glaciation.

Mountains continued to be thrust up along the Alpine Fault during the Quaternary Period. Volcanic activity continued. Despite all the

physical and climatic change in New Zealand, some of the Gondwana-derived flora survived.

The sea level fluctuations which resulted from growth and contraction of the ice caps affected coastal environments. Glaciations seriously affected South Island because of the height and extent of its mountain ranges. The snowline was depressed by about 1000m [compared with the present one] and there was a reduction of about 6°C in mean temperature.

During the ice age fluctuations, vegetation changes were drastic in South Island. Coastal fringes would have been a refuge for an assortment of plants allowing them to survive and be available to spread back into suitable areas as conditions improved. The present forests in South Island are the result of natural reforestation since the last glacial 14,000 years ago.

In North Island, glaciers were formed only on the high peaks. A zone around the mountains may have been tundra-like with summer temperatures below 10°C, but most of the island would have been able to support mixed forest.

The recurrent glacial episodes in New Zealand markedly changed the vegetation. Warm-temperate forms disappeared from the Pollen Record. Transitional pollen floras from the Tertiary-Quaternary boundary in the south Auckland region of North Island give an idea of the fluctuations in the vegetation. A flora at Huntly, N.I., shows changes from Nothofagus brassii dominance to Nothofagus fusca in the Late Miocene to the Pliocene, and from Nothofagus fusca to Podocarp Conifer dominance in the Pleistocene.

As the ice age proceeded, a number of taxa became extinct in New Zealand. Proteaceae were reduced to two species, Knightia excelsa and Persoonia toru. Acacia disappeared. The variety of habitats and environments enabled the Modern New Zealand Flora to survive and regroup to form the modern vegetation patterns after the last glacial period.

From a scientific point of view the importance of New Zealand's Cainozoic floras cannot be overestimated, because of their wholly Cretaceous ancestry and their evolution-in-isolation since.

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The following six pages, jointly worked by Brian Halliwell and Jeff Irons, briefly describe plants under three headings : those suitable as indoors plants, plants for small gardens, and plants for the beginner. Many may be easily grown from seed or obtained via the Plant Finder.

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HOUSEPLANTS

ACMENA SMITHII

Dense glossy leaves, with bronze-coloured new foliage. Needs to be grown from fresh seed.

ASPLENIUM BULBIFERUM
Rhizomatous with evergreen fronds of 60cm [2ft] or more, twice pinnate, dull green above and brownish beneath. Tiny plantlets are produced on the upper side of pinnae which can be detached for propagation. Well suited to low light and is more tolerant of dryness than many ferns.

CISSUS [RHOICISSUS] ANTARCTICA
Evergreen climber of moderate vigour. Stems climb by means of tendrils. Light green ovate-oblong leaves some 8x2cm [3"x0.8"] which have toothed margins. Best in partial shade.

COPROSMA REPENS & cvs
Large evergreen shrub with, on prominent petioles, opposite leaves some 5cm [2"] across which are roundish and shining green. There are cultivars with white and yellow variations. Is tolerant of sunshine or shade.

CORDYLINE AUSTRALIS
Medium tree with a single trunk from whose upper portion are produced masses of narrow arching leaves to 1m [3.3ft] in length; in addition to green these can be of shades of red and there are a number of kinds of variegation. Best with plenty of light.

CORREA PULCHELLA
To 1.5m [5ft] if unpruned. Pendulous bell shaped pink flowers all winter. Can be propagated from cuttings taken after flowering.

DAVIDSONIA PRURIENS
It is slow growing and has large pinnate leaves. Is actually a 30m [100ft] tree so is unlikely to flower. Propagate from fresh seed.

FICUS BENJAMINA
Has drooping branchlets and leaves. Do not over-water in winter. Tolerates shade.

FICUS RUBIGINOSA 'VARIEGATA'
Spreading much branched shrub or tree with alternate oval leaves to 10x5cm [4x2"]; these are green, margined with white, which can be covered with brown down as they unfurl and whilst most of this is shed, some remains attached to the mid rib on the underside. Grow in full sun or shade.

GREVILLEA ROBUSTA
Attractive feathery leaves, stands low winter temperatures. Propagate from seed.

HOWEA FORSTERIANA
A very handsome palm which will grow in a pot for many years. Needs to be grown from fresh seed and most of the plants seen in garden centres have been grown on from exported seedlings. Often sold as a Kentia.

HOYA AUSTRALIS
Thick succulent leaves, white flowers with a red spot on each lobe. Grow in sandy mix, needs good light. Hoyas have special flowering stems which take two years to develop so do not cut blooms. Propagate from seed or cuttings.

LIVISTONIA DECIPIENS
Another palm with fan shaped leaves. Can be kept in a pot for many years.

LEPIDOZAMIA PEROFFSKYANA
One of the faster of the slow growing cycads. Can reach 2m [6.5ft] in less than 100 years. A long lived container plant. Stiff shiny fronds.

METROSIDEROS EXCELSA 'VARIEGATA'
Much branched somewhat spreading large shrub or small tree with lanceolate leaves 8x3cm [3.1x1.2"] which are green above with a white margin and felted beneath. Best trimmed to shape in March before new growth begins. Grow in plenty of light.

PISONIA BRUNONIANA 'VARIEGATA'
Large upright shrub or small tree usually confined to a single stem. There are opposite or whorled leaves which are elliptical oblong to 20x5cm [8x2"] which are deep green and shining with irregular yellow margins; young leaves are flushed with pink. Best in partial shade.

PITTOSPORUM EUGENOIDES 'VARIEGATUM'
Spreading large shrub or small tree with whorls of narrow undulate, lanceolate, light green aromatic leaves which are margined with white. Occasionally on old bushes are produced axillary umbels of fragrant yellowish green flowers. Best with plenty of light.

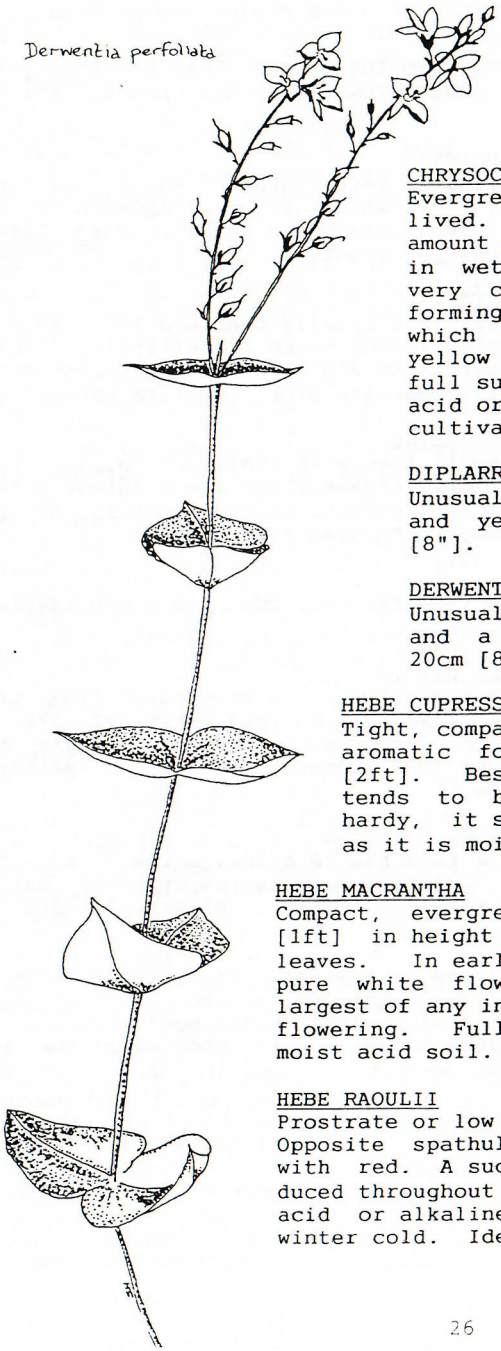
PROSTANTHERA ROTUNDIFOLIA
Aromatic foliage and a long flowering period. Tip prune regularly to maintain bushiness.

PSEUDOPANAX LESSONII cvs and hybrids
Medium upright evergreen shrub with leaves crowded at tips of branches. Palmately compound leaves are on long petioles; leaflets to 8x3cm [3.1x1.2"] are thick, dark green and with sinuate margins. There are cvs with narrower leaf segments and others patterned in gold. Grow in partial shade.

RHOPALOSTYLIS SAPIDA
Slow growing medium palm with a single trunk. There are terminal pinnate fronds upto 2m [6.6ft] long with narrow opposite dark green leaflets which can reach 60cm [2ft]. Grow in plenty of light.

SCHEFFLERA DIGITATA
Medium evergreen shrub of one or several upright stems with leaves crowded terminally. These are palmately compound with varying numbers of leaflets between 3 and 9 although 5 is the most frequent. Dark green these are up to 15x4cm [6x1.5"] often lobed with toothed margins. Grow in sun or shade.

SYZYGIUM OLEOSUM
A particularly nice Lilly Pilly. Shiny, elliptical leaves and white flowers.



CALLISTEMON PITYOIDES
A small, dense, weed-smothering bottlebrush. Yellow flowers in May - June. 1m [3.3ft]; prune after flowering.

CHRYSOCEPHALUM APICULATUM
Evergreen perennial which can be short-lived. Will tolerate a reasonable amount or dry winter cold but is unhappy in wet soils and liable to damage in very cold winters. Usually prostrate forming mats of grey felted growth from which arise stems to 15cm [6"] with yellow daisy-like flowers. Plant in full sun, in a not too rich soil, either acid or alkaline. Suited to rock garden cultivation.

DIPLARRENA LATIFOLIA
Unusual irid, white flowers with purple and yellow markings in May/June. 20cm [8"].

DERWENTIA [PARAHEBE/VERONICA] PERFOLIATA
Unusual stem clasping glaucous leaves and a bonus of purple flowers in June. 20cm [8"]. Best in an sunny position.

HEBE CUPRESSOIDES 'BOUGHTON DOME'
Tight, compact and conifer-like, blue-green, aromatic foliage making a bun upto 60cm [2ft]. Best replaced after 5-6 years as it tends to become untidy with age. Fully hardy, it seems indifferent to soil as long as it is moist.

HEBE MACRANTHA
Compact, evergreen shrub rarely more than 30cms [1ft] in height with crowded opposite elliptical leaves. In early summer are produced masses of pure white flowers which individually are the largest of any in the genus. Prune annually after flowering. Fully hardy, it seems better in a moist acid soil.

HEBE RAOULII
Prostrate or low growing, it is slowly spreading. Opposite spathulate light green leaves are edged with red. A succession of pink flowers are produced throughout the summer. Plant in full sun in acid or alkaline soil; can be damaged in extreme winter cold. Ideal for rock garden.

HEBE "YOUNGII" ["CARL TESCHNER"]
Weed smothering low growing Hebe. Purple flowers in June. 20cm [8"].

HELICHRYSUM BELLIDIODES
Prostrate evergreen perennial varying in habit and quality. Small roundish alternate leaves are dark green above and white felted beneath. Succession of daisy-like flowers with incurving white petals. Fully hardy and indifferent to soil that is well drained.

LAGAROSTROBOS FRANKLINII
Attractive drooping conifer for a moist spot. Ideal poolside plant. Slow growing.

LEPTOSPERMUM "NICHOLSII NANUM"
Still one of the best, and one of the hardiest. See page 19.

LEPTOSPERMUM SCOPARIUM [NANUM GROUP]
Small compact evergreen shrubs to 60cm [2ft]. Crowded tiny lanceolate leaves. Flowers, in shades of pink, are produced in one or more flushes. There is a range of cvs named after New Zealand birds. Whilst the hardiest of L. scoparium are liable to damage by winter cold, plant in full sun in a not too rich acid soil.

LEUCOCHRYSUM [HELIPTERUM] ALBICANS SSP ALPINUM
White leaves and attractive red buds in April-May, followed by white daisies. Likes a well drained, sunny site. 10cm [4"].

LINUM MONOGYNUM
Perennial which from a stout rootstock produces stems to 30cm [1ft] with alternate short narrow leaves. Terminal cyme of white flowers produced in succession throughout summer. Although Brian has only grown this plant on an acid soil, he expects it to be tolerant of lime. Seems to be fully hardy.

OLEARIA "SCILLONIENSIS"
Greeny-grey leaves and dazzling white daisies in May. Prune after flowering to keep it to 1m [3.3ft].

OZOTHAMNUS [HELICHRYSUM] LEDIFOLIUS
Bi-coloured green and yellow evergreen shrub. Terracotta buds in April-May, followed by white flowers. Slow growing.

PHORMIUM TENAX 'ALPINUM PURPUREUM'
Probably the smallest of New Zealand flaxes, it rarely exceeds 25cm [10"]. Narrow upright reddish leaves. Fully hardy; it seems indifferent to soil; plant in full sun.

PITTOSPORUM TENUIFOLIUM 'TOM THUMB'
Slow growing, compact evergreen shrub which can reach 1m [3.3ft]. Undulating, oval, dark purple leaves. Blackish purple flowers are occasionally produced on old plants. Indifferent to soil; dislikes exposure to cold winter winds. Plant in full sun in a warm garden.

PODOCARPUS NIVALIS
Small, evergreen fully hardy conifer of varying habits; prostrate mound-like or upright to 60cm [2ft]. There are crowded yellowish green yew-like leaves.

PSEUDOWINTERA [DRIMYS] COLORATA
Multicoloured leaves which come into their own in the darker months of the year. Will stand open shade. Fairly slow growing, and can be pruned to desired height.

SENECIO [BRACHYGLOTTIS] MONROI
Small compact shrub to one metre with young stems, petioles and undersides of leaves, white felted; alternate oval leaves with waxy margins are brownish green above. In summer there are yellow daisies to 2cm [0.8"] in diameter. It seems to be fully hardy but plant in full sun in an acid or alkaline soil.

WAHLENBERGIA GLORIOSA
Aptly named for this is the best species within the genus for flower. From a rootstock are produced somewhat sprawling stems to 15cm [6"] with crowded elliptical leaves. Terminal flowers are upright bell-shaped upto 4cm [1.5"] in diameter and medium blue to violet in colour. Liable to damage by extreme winter cold, it dislikes its roots in frozen soil. If planted in a crevice on a rock garden, the rocks prevent or reduce frost penetration.

BEGINNERS' PLANTS

ACAENA 'BLUE HAZE'
Prostrate or low growing hardy spreading shrub with thin stems. Alternate leaves are pinnate with a few opposite roundish toothed leaflets which are lavender-grey. Best in full sun, in the poorest of dry soils; in a good soil or in shade the plant grows lush, has poor colour and is liable to die out. Flowers have little merit.

ACTINOTUS HELIANTHI
Short lived perennial usually treated as an annual. Sow seeds in heat in April and plant out in early June. Stems rise to 60cm [2ft] with terminal tiny white flowers but the main attraction is the white felted involucral bract.


Actinotus helianthi

BLECHNUM PENNA-MARINA
Hardy, this is the easiest of small ferns for any kind of moist soil in sun or shade and when conditions suit, is a rapid coloniser. Rhizomatous, it has fronds of two types : vegetative and fertile. The former which are the outer, lie on the ground and can reach 10cm [4"] and these are once pinnate with alternate pinnae which are dark green above; the central fertile fronds are upright and brown.

BRACHYSCOME IBERIDIFOLIA
Half hardy annual which should be sown in heat in April and planted in the garden in early June. On stems to 30cm [1ft] are produced blue, white or violet daisy flowers. Indifferent to soil.

BRACTEANTHA BRACTEATA
Annual in a range of colours : white, yellow, orange, pink and red. Sow where plants are to flower in late April and thin seedlings to 25cm [10"] apart, or raise under glass to plant out in early June. On stems to 45cm [18"] are produced daisy-like flowers with incurving tough petals. In addition to being used for summer display, flowers are cut as they open for drying. Seems indifferent to soil types. Perennial forms are are not reliably hardy in Britain.

EUCALYPTUS PERRINIANA
Evergreen tree to 15m [50ft] but is better as a medium shrub being pruned hard each year in April. This retains its juvenile leaves [light bluish grey, round in outline and encircling the stems] which are far more handsome than the alternate green falcate adult. One of the hardiest species. Sow seed in April in frame or cold glasshouse; prick out seedlings as soon as big enough to handle, singly into small pots. Plant out in late May whilst still small and before they become root bound; subsequent growth is rapid. Best in a lime-free soil.

GREVILLEA 'CANBERRA GEM'
A vigorous shrub with an upright and spreading habit. Narrow, dark green leaves are crowded on the branchlets. Pinkish red flowers are borne in racemes from March/April and continue for much of the year.

HARDENBERGIA COMPTONIANA
A vigorous climber with dark, shiny leaves, producing long sprays of deep purple flowers in the spring. Good drainage is essential.

HEBE X ANDERSONII
One of the hardiest shrubby veronicas making an evergreen shrub to 2m [6.6ft]. There are crowded opposite narrow lanceolate slightly re-curving leaves to 10cm [4"]. In summer, from upper axils are spikes of violet and white flowers; there is a variegated leaf form. Benefits from hard pruning in April. Seems indifferent to soil.

OLEARIA X HAASTII
Hardy evergreen shrub to 3m [10ft] with crowded dark green oval leaves to 2.5cm [1"] long. In summer there are large heads of white daisy flowers. Pruning annually after flowers have faded keeps bushes tidy, smaller and induces freer flowering. Seems to prefer an acid soil.

PROSTANTHERA CUNEATA
Small compact hardy evergreen shrub to 60cm [2ft] with aromatic leaves. In summer there is a succession of white flowers which are flushed lilac; newer cvs have better coloured flowers and there are some with variegated leaves. Requires a moist acid soil.

SENECIO [BRACHYGLOTTIS] 'DUNEDIN HYBRIDS'
Formerly known as S. greyi or S. laxifolia, it is now considered to be of hybrid origin of which the cv "Sunshine" is a selection most often grown in British gardens. Hardy evergreen shrub with a sprawling habit 1m [3.3ft] or more in height. Handsome, alternate grey leaves accompanied in summer by an impressive display of yellow daisies upto 3cm [1.2"] in diameter. Prune after flowering to keep tidy. Indifferent to soil.

CALLISTEMON PITYOIDES and DERWENTIA PERFOLIÀTA see Page 26

BOOK REVIEW

The Cultivation of New Zealand Plants
by Lawrie Metcalf; Godwit Press, Auckland

This book is the companion volume to the author's 'The Cultivation of New Zealand Trees and Shrubs'. It fills a gap in the available literature, and though written for New Zealand gardeners, contains much information which is useful to gardeners in other parts of the world. There are chapters on such aspects as propagation, but the bulk of the text consists of an alphabetical listing of plants. This contains much information that is not usually given in books. One example is that Leucopogon fraseri is not self fertile. English growers usually find that out when their one bought plant fails to fruit. Another is that the 'sudden death' after flowering of some Aciphylla species is the result of Phytophthora or Rhizoctonia infection. Inevitably there are some omissions, Craspedia uniflora is one, but they do not detract from the value of the work.

SOPHORA TETRAPTERA

Sophora tetraptera, kowhai, is regarded as the national flower of New Zealand. Its not difficult to understand why this is so. In the early spring, before the new leaves appear, large showy, golden-yellow, pea-type flowers, each up to 6cm [2.4"] long, hang in great profusion from the leafless branches.

Kowhai forms a tree up to 12m [40ft] tall with a trunk up to 60cm [2ft] in diameter. The adult kowhai has pinnate leaves of lengths varying up to 15cm [6"] and made up with up to 40 individual leaflets 1-3cm [0.3-1.25"] long.

Although kowhai can survive outside in all but the coldest areas of Britain, it is preferred to grow it against a favoured sunny wall. In New Zealand its natural habitat is the sunny east side of the North Island. It requires well drained soil and does not seem to object to lime. It is best to wait until the seedlings are a few years old before planting out into the garden, and even older seedlings which have been planted outside should be given some protection from severe frosts for the first few years. Alternatively, Sophora can be grown in the glasshouse or conservatory. Under glass, young plants may be subject to occasional attacks by red spider mites and scale insects.

Propagation from seed is easy providing the seeds are fresh. If collecting seed from a fruiting plant, do so just before the 4-winged pods, up to 20cm [8"] long, turn from green to brown, and sow immediately. Since the seed coat has not fully hardened, germination should occur in about a month. It may take six years from germination before flowers are produced.

From seed taken back to England by Mr. Joseph Banks in 1771, plants of Sophora tetraptera were raised successfully. In 1774, Mr. William Forsyth, Curator of the Chelsea Physic Garden, planted one of these seedlings. It flowered in 1779, and John Miller drew it for his "Icones Novae" of 1780.

Dr. William Pitcarn planted another seedling in his 5 acres 'botanical garden' in Islington. It also flowered in 1779.

In 1791, William Curtis published a lovely handcoloured engraving of Sophora tetraptera, with the comment :

> "A finer sight can scarcely be imagined than a tree of this sort, extending to a great breadth on a wall with a western aspect, in the Apothecaries Garden at Chelsea...and which at this moment [April 28, 1791] is thickly covered with large pendulous branches of yellow..."

HEBE 'KARO GOLDEN ESK'

In Volume 3, Number 2, of 'Horticulture in New Zealand', the Journal of the Royal New Zealand Institute of Horticulture, is an article written by Peter Heenan of the Botany Institute, DSIR Land resources, Christchurch, about a new cultivar - Hebe 'Karo Golden Esk'.

In March 1988, while making a botanical survey of the Upper Esk Valley, Waimakariri River catchment, Canterbury, Dr Brian Molloy, a DSIR botanist, noticed an unusual hebe amongst a group of Hebe odora. Growing on the margin of a tarn, it was about 30cm [1ft] tall with a rather straggling appearance and appeared to be in poor health possibly due to poor drainage. It showed no resemblance to H. odora, or H. armstrongii, the only other hebe growing nearby. Since these were the only two hebes present, Dr Molloy concluded that the plant was possibly a natural hybrid between them, with H. odora most likely the maternal parent as the hybrid was found growing amongst a population of such. Hybridism involving H. armstrongii had not been recorded before so the plant was regarded as a botanical curiosity. A few small branches were collected for propagation purposes.

The hebe, named Hebe 'Karo Golden Esk', ["Karo" is an acronym of "Known and Recorded Origin", "Golden" refers to the foliage colour, and "Esk" to the Esk River], forms an attractively shaped, yellow-green to golden coloured, even foliaged plant, unmatched by any other whipcord hebe or their hybrids, with lots of potential. After three years it reaches a size 40cm [15.5"] tall with a spread of 80cm [31"]. It is regarded as a natural hybrid between species from two different sections of Hebe, H. odora [Buxifoliatae] and H. armstrongii [Flagriformes - whipcords]. Trialled in a range of soils, it has performed satisfactorily in heavy, moist, clay soils as well as on light, dry, gravelly ones. Like most hebes in cultivation, it performs best where moisture is readily available and the soil is rich in organic matter and of good structure. It has been subjected to ground temperatures of between -6°C to -8°C with no visible frost damage. Both parents are amongst the hardiest hebes.

Although superficially similar to some whipcord species, it can be distinguished from H. armstrongii, H. armstrongii 'Winter Gold', H. ochracea, H. ochracea 'James Stirling', H. cupressoides, H. hectorii and H. lycopodioides by having only the top 8-12 pairs of leaves on each branchlet appressed to the stem, while those below are spreading and diverge at an angle of between 45 and 60 degrees. In the above

mentioned species and cultivars, all the leaves are appressed to the stem. Its flowers are white whereas those of H. cupressoides and some plants of H. armstrongii are pale to strong mauve.

WATTLE SHE'LL STEAL NEXT?

In a recent newsletter published by The Friends of Ness Gardens, is a copy of a poem displayed on the walls of a Melbourne garden centre. It would seem that the stealing of plants from gardens and garden centres is universal.

> I know a charming woman. and every time she calls
> She leaves my carpet on the floor, my pictures on the walls
> She doesn't steal my silver, or ask me for a loan;
> She doesn't use my fountain pen, she always brings her own.
> But show her in your garden the treasures you have got,
> And if you turn your head away, she'll pinch the blooming lot!

TEA OR COFFEE?

In 'A Voyage Round the World in His Britannic Majesty's Sloop, Resolution' 1777, George Forster, who had accompanied his father J R Forster on Captain James Cook's second voyage, wrote

> ....on the first day of our arrival [at Dusky Bay] we found a beautiful tree in flower, something related to the Myrtle genus, of which an infusion had been drank instead of tea on Captain Cook's former voyage. We immediately repeated the experiment with great eagerness as we had not seen any plant which was fit to be used at our table. Its leaves were finely aromatic, astringent, and had a pleasant flavour at the first infusion, but this fine taste went off at the next filling of the teapot, and a great degree of bitterness was then extracted. We never therefore suffered it to be twice infused. The use of this plant, which became general among our crew, probably contributed greatly to restore their strength, and to remove all scorbutic symptoms...

Known today as manuka [Leptospermum scoparium], Banks and Solander knew the tea tree as Philadelphus. Other plants used to make tea include the leaves of bidibid [Acaena species], and of kawakawa [Macropiper excelsum] as well as the bark of tawa [Beilschmiedia tawa]. A. Crowe, in 'A Field Guide to the Native Edible Plants of New Zealand' 1981, described the taste of bidibid tea as a mixture of musty tea and cabbage water, and recommended the addition of honey.

About 1877, J C Crawford, a member of the Wellington Philosophical Society, roasted and ground the seeds of karamu [Coprosma lucida] and of taupata [C. repens] to make coffee for fellow members. Although it belongs to the Rubiaceae, the family of the coffee plant, Coffea arabica, the seeds of Coprosma are much smaller than those of Coffea, and not worth the trouble of collecting and cleaning. Other plants used as coffee substitutes include the root of the introduced dandelion Taraxacum officinale and the native species T. magellanicum, as well as the seeds of New Zealand flax Phormium tenax.

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