AUSTRALASIAN PLANT SOCIETY

NEWSLETTER NO.6. APRIL 1991

EDITORIAL

Dear Members,

This winter has brought the most severe cold spell since 1987. Some of us will have had the benefit of a protective snow cover. Others will have had the low temperatures without the snow. The unpleásant weather has given us an opportunity to assess the hardiness of our Antipodean plants, both outdoors and under cover. Please will you give us details of your losses and survivors - especially the unexpected ones. Other information which would be helpful includes aspect, length of time in situation, amount of ground cover, minimum temperature, drainage, and for indoor plants the size of pot.

GROWING AUSTRALIAN PLANTS
Part One

The Australian Flora has a wide range of species, many of them strange to northern gardeners. Though many have links with the northern hemisphere flora, more have links with the flora of the Pacific region, or with those of South America and New Zealand. A third group is uniquely Australian. Within that group there is a separate group of Western Australian plants. Western Australia is cut off from the rest of the country by the deserts which surround it, so its flora if different from that of the rest of Australia.

Australian plants have been cultivated in other countries since the late 1700's. In Britain they have never achieved great popularity. Not even the 'Everlastings' are common garden plants. In part the lack of popularity is a result of the belief that all are tender plants, suited only to protected cultivation. In part it is because a number of the hardier ones are quite tricky, especially in south-eastern England. Many of the plants which are grown have unusual features which make them stand out in the garden. In particular Eucalypts and Acacias have distinctive leaves, Callistemons and Grevilleas have unusual flowers.

Most of the Australian plants that can be grown in Britain are quite happy in a slightly acid soil, say pH 6,5 or less. Some may be lime haters. Almost without exception they must have good drainage. This is especially important in winter, and many deaths are the result of inadequate drainage. This can be true even for species which grow naturally in wet situations. Though wet, the soil around them is well aerated. Wet soil in a flat garden, or in a pot will result in their death. While a number of plants are equipped to cope with low air temperatures, few are able to stand desiccating dry winds when the soil is frozen. This is a frequent cause of winter death. A specimen of a plant grown in a pot placed in an open polytunnel may survive while a similar plant in the ground will die. Death of the latter will have been from desiccation because its leaves were unable to replace water lost by evaporation, not because its roots were frozen. Good ventilation is probably as important as drainage, particularly for plants overwintered under glass. Some woody seedlings, such as those of *Lomatia*, are particularly prone to fungal attack in winter. When they are in active growth others, such as *Coprosma moorei* need a buoyant atmosphere. At the same time it must be cool and damp.

Many of the plants which collectors will want are not available from nurseries, of necessity they will have to be grown from seed. This too has its problems. Most eastern plants occur naturally on acid soils. Some western plants must have lime. In general it is

preferable to use an open lime-free compost when sowing seeds; two parts Perlite or coarse sand and one part of peat is a good general purpose mix. As a general rule seed should be surface sown, and never allowed to be dried out after sowing. Another general rule is that seedlings should be transplanted as soon as they can be handled. With Proteaceae this will be as soon as any green can be seen on the seed. With some other plants it will be when they are 10mm [approx ½"] high and do not have true leaves. In many instances it will be found that even at this size seedlings have long roots. They will need root pruning before they are transplanted. A lime-free open compost will suit most species. *Callistemons* have been reported to be averse to lime, and to die when transplanted into a lime-containing compost.

Many species are difficult to germinate, and they require special treatments. The most common of these are;

1. Seeds with a hard or woody coat.

These have an impermeable barrier which must be penetrated before germination can take place. The simplest treatment is to pour boiling water over the seeds and to leave them overnight. Seeds which have plumped up are removed the next day and sown, the treatment is repeated on the remainder. Two or even three treatments are often necessary. Usually treated seed will germinate quickly, but sometimes erratic or delayed germination will be experienced. *Acacia lucasii* is a species which exhibits both immediate and delayed germination. This feature of germination over a long period is fairly common in Acacias. A few species may be damaged by the hot water method and should be treated with warm water instead.

Physical abrasion will achieve the same effect as boiling water, but it is not as easy to do as is made out. Seed is scarified by rubbing it between two pieces of glass or emery paper. Large seeds can have a nick filed in their outer coat.

The seed coating can be broken by exposure to microwave radiation of the frequency used in a domestic microwave oven. This is suitable only for large scale operation, for each species has its own duration of exposure, and it has to be found out by experimentation. A water ballast must be present when practising this method.

Australian *Coprosmas* are almost impossible to germinate. Some success has been obtained by alternately wetting the seed and exposing it to hot sun. Some success has been obtained by soaking the seed in concentrated sulphuric acid. However this latter treatment should be tried only by those with the appropriate technical knowledge, and knowledge of the dangers associated with conc. sulphuric acid.

2. Inhibitors.

Some species contain germination inhibitors. These are usually water soluble, and can be washed out. It is possible to sow seed, then expose it to rainfall, or to wash the seed in running water. A simple method, which has been used successfully with the two Pittosporaceae *P. bicolor* and *Billardiera longiflora* is to place the seed in a muslin bag, and then to hang the bag in a lavatory cistern for 6 weeks. Other species which require leaching are Correa, Crowea and Eriostemon.

3. Chilling.

Several species require pre-chilling. Little is known about how many there are. Both *Banksia canei* and *Eucalyptus kybeanensis* are known to need chilling. It can be achieved by mixing the seed with moist peat, and placing the mixture in the bottom of a refrigerator for at least six weeks. *Drymophila cyanocarpa* also needs exposure to cold, but its seeds will not stand exposure to frost. The traditional British treatment of outdoor stratification will kill the seed. Some Iridaceae and 'Liliaceae' are winter growers, and will not germinate in high temperatures. An example is *Dichopogon strictus*, which does not germinate until the lower temperatures of autumn arrive.

Other factors are involved too. Sometimes we can only guess at the reasons for non-germination. Many people have tried to work out why *Nothofagus gunnii* is difficult to germinate. To my knowledge only once has it been germinated in Britain. One reason may be that viable seed is set only very occasionally, and that even then it needs to be kept moist until sown. A Tasmanian alpine with a reputation for being difficult is *Bellendena montana*. Once I managed to get seed to germinate, but have no idea why it did so. In Tasmania some success has been reported from the use of green seed. A few species must be fresh and moist for seed to germinate. Two examples are *Richea* and *Trochocarpa*. Dry seed of both will not germinate. Fresh moist seed of both will. *Trochocarpa* seed should preferably be in its drupe, and sowing should be simply by rubbing the opened drupe across the compost surface. Some species require storage for two to three years before they will germinate. In the case of *Eriostemon* the motto is 'First catch your emu'. This is a reference to the fact that abrasion followed by exposure to the emu's digestive juices is believed to be necessary for achievement of a high germination percentage.

AUSTRALIA 1990 by Thomas Ross

In October and November 1990, I paid another visit to Australia. I first went to Adelaide where I rented a car and drove through the Fleurieu peninsula to Victor Harbour, then to Murray Bridge and up north to the Flinders Ranges, Wilpena Pound, the Brachina Gorge and back to Adelaide. It was a good season for plant watching [not for seed collecting of course]. The Callistemons were in full flower, the most impressive being 'Harkness' which is frequently used as a street tree. 'Perth Pink', which I saw in the Wittunga Botanical Garden, is also a very beautiful cultivar. For wildflowers, the Flinders Ranges were best. I saw *Callistemon macropunctatus* and *C. teretifolius* in the wild, lots of orchids, many *Dampieras* [a particularly showy patch right up on Mt. Ohlsen Bagge in the Wilpena Pound], *Petalostylis labicheoides* [a grey leaf, compact form on the slopes of the Mt. Ohlsen Bagge] and many other. The Murray river was spectacular as it was almost at flood level.

My next stop was Alice Springs where I arrived just in time for the first heat wave with 42 degrees centigrade at Ayres Rock. After a few wet years, the vegetation is almost lush - certainly lusher than in many drier parts of South Australia - savannah woodland of 7 - 8 m [7½ - 9 ft] in height [*Allocasuarina decaisneana, Atalaya hemiglauca, Grevillea sp., Acacia aneura* etc] being very frequent. As it had rained a few weeks before, there were still some ephemerals in flower, and the *Atalaya* was flowering everywhere. The leaves of this tree have a fresh green colour you would not expect in such an arid environment. I climbed Ayres Rock - what an experience - and I visited Palm Valley. After those wet years, plentiful young *Livistona mariae* are springing up far outside the range of their parents. My day at the Palm Valley was the nicest one I had in Central Australia, maybe also because the temperature had dropped to a pleasant 34 degrees centigrade.

From Alice Springs, I flew to Tasmania where I spent 2 days with Marion and John Simmons. They kindly drove me up into the northeastern mountains of Tasmania where I saw *Acacia pataczeckii* in flower, *Telopea truncata* in bud, *Acacia dealbata* in flower and lots of delightful small shrubs like *Pultenaea pedunculata, Hibbertia pedunculata, Oxylobium ellipticum* etc. In Marion's garden, the most impressive sight was an *Acacia pulchella* so laden with huge, densely packed golden yellow balls that most of the foliage was no longer visible. It looked like some mutant polyploid form. John, who is an experienced photographer, gave me some valuable advice on taking pictures. Just before leaving Germany, I had bought a new camera which I was not yet familiar with. And anyway I am a bad photographer. But I am trying to learn.

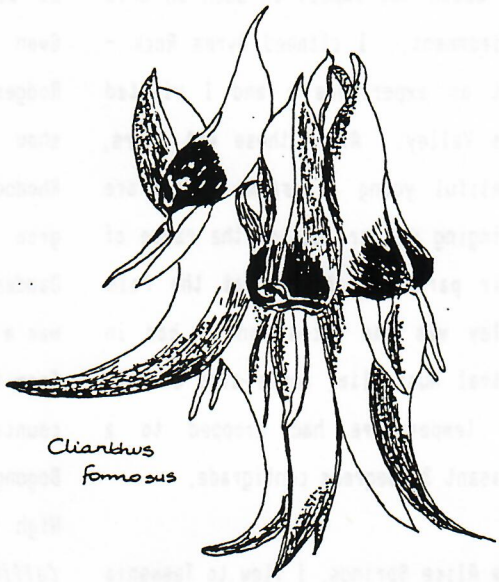
From Tasmania, I went to Melbourne where I stayed with the same friends as always. I visited Rodger and Gwen Elliott's garden again and Rodger took me to a suburban flower show - I have never seen so many Rhododendron flowers. Rhododendrons grow very well in the moist Dandenongs. The Elliott's garden was a delight once more. My friends from Croydon drove with me to their country house at Bright, near Mt. Bogong. A short visit to the Bogong High Plains, where I hoped to see *Callistemon pityoides* in the wild, had to be cut short because of stormy weather. But I saw *Acacia obliquinervia* in flower just below the tree line, *Bossiaea foliosa, Grevillea victoriae* also just below the tree line. Above the tree line, there were *Phebaliums, Kunzea muelleri, Epacrids, Hovea montana* in bud and a lot of others. Many of the snow gums had broken limbs because of 'the heaviest snowfalls in memory'. The road had just been cleared a few days before. In the montane forests, I saw *Acacia kettlewelliae, A. pravissima* and *A. dallachiana* in flower, the most beautiful clearly being *A. pravissima*.

CLIANTHUS by Sue Hyams

The genus *Clianthus*, in the Fabaceae, consists of two species, one found in Australia and the other in New Zealand.

Clianthus formosus, Sturt's Desert Pea, is endemic to Australia and is in fact South Australia's floral emblem. It was first discovered by the explorer William Dampier [1652-1715] when, as captain of HMS Roebuck, he visited the islands off the coast of north-western Australia that came to be called Dampier's Archipelago. In fact, the plant used to be called *Clianthus dampieri*, but in 1909, two botanists changed its name to *Clianthus speciosa* for reasons unknown. In 1950, two other botanists, Ford and Vickery, changed its name to *C. formosus*. Dampier's collection of 23 specimens is housed in the Sherardian Herbarium at Oxford.

In July 1817, the next collection of the Desert Pea was made by the explorer and botanist Allan Cunningham. Discovered on the shores of Regents Lake on the River Lachlan, the plant was called *Kennedya speciosa* by Cunningham who was not then aware of Dampier's discovery. In 1818, he 'discovered' his *Kennedya* growing on an island in the Dampier Archipelago. In 1835, in the Transactions of the Horticultural Society in London, he described these two plants as two separate species - *Clianthus oxleyi* for the Lachlan River specimens and *C. dampieri* for that from the Dampieri Archipelago.



After its initial discovery on Dampier's Archipelago, it was found to grow on many parts of the mainland as well, across the whole of the dry hot areas. One of Australia's most determined explorers was Charles Sturt. In 1844-5, while exploring the arid interior of the island, he wrote about the beauty of a pea plant in the otherwise bleak wasteland of sand. Specimens were brought back and the similarities between the plant discovered by Dampier and this new plant were noted. It is in Sturt's honour that *Clianthus formosus* obtained the name Sturt's Desert Pea.

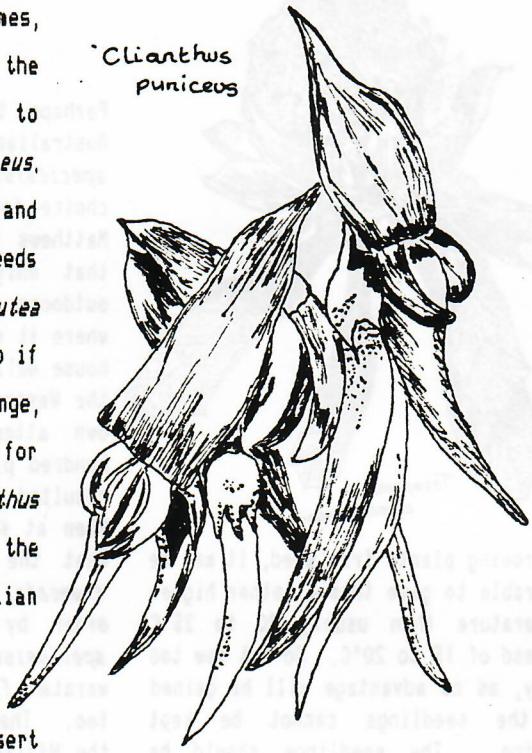
Clianthus formosus is found in Qld, NSW, SA, WA, and NT. It is a prostrate plant with woolly greyish pinnate leaves and spectacular heads of large, shiny, red pea-shaped flowers with bulbous velvet-black eyes in the middle. Occasionally the eyes are red and rarely white. In its native habitat, it flowers June to March. The flowers are 5 - 6cm [2 - 2½ inches] long and are produced in clusters of 4-6.

It is not a particularly easy plant to cultivate. In Australia, the seeds of *Clianthus formosus* are scattered on the sandy soil and germinate readily after torrential rain. But the surface moisture is negligible after this so the seedlings have to send down very long roots to find moisture if they are to survive. It resents root disturbance so it is best to sow seeds in the position in which they are to grow. If to be grown in containers, deep pots need to be used to accomodate the exceptionally long taproot. The plant does best in sandy soil [good drainage is required] in full sun. Once the plant is established, watering should be kept to a minimum. The plant is highly susceptible to basal stem rot, but this is less likely if the surface of the compost is kept dry.

Although it can be grown on its own roots, *Clianthus formosus* has a habit of dying just before it flowers. It has been found that if grafted as a young seedling onto a similar seedling of *Colutea arborescens*, it grows and blossoms much more freely and lives longer. However, grafting onto *Colutea* is not easy because the two sowings have to be made at different times, the *Colutea* growing faster than the *Clianthus*. It is preferable to graft onto *Clianthus puniceus*. Chiltern Seeds and Thompson and Morgan offer a kit containing seeds of *Clianthus formosus* and *Colutea arborescens* plus instructions, so if you are looking for a challenge, order now.. Further instructions for the cultivation of *Clianthus formosus* can be found in the September 1990 issue of Australian Plants.

It wasn't until 1834 that the Desert Pea was introduced to England for horticultural purposes by Messrs. Veitch and Sons of Exeter, under the name of *Kennedya speciosa*. In 1850 a flowering specimen from their greenhouses was awarded a large silver medal of the Horticultural Society in the April exhibition; according to Paxton's Flower Garden of 1850 - 51 'an honour never conferred upon any new plants, except such as are of surpassing values as objects of cultivation.'

Clianthus puniceus, Parrot's Bill, occurs only in New Zealand. Growing only on the North Island, it is now becoming rare in the wild and is more likely to be seen in cultivation. It was first cultivated by the Maoris, who have given it the name Kakabeak.



Left to its own devices, it can be a very untidy plant growing to a height of 4 metres [12 feet] with spreading or trailing branches. But it can be trained into a neat bush against a trellis. The pinnate mid-green leaves are composed of from 12 to 24 leaflets. In May and June [in the UK], racemes of six or more 10cm [4"] long crimson-scarlet, claw-shaped flowers appear. Various Maori names have been used to describe the shape of these blossoms - ngutu kakarika and kowhai-ngutu-kaka - which refer to the beaks of parakeets and kakas [N.Z. parrots].

At Wisley in May 1989, I saw both a red and white form in the glasshouse : *Clianthus puniceus 'Flamingo'* and *'Albus'*. *Puniceus* is much easier to grow than *formosus*. Planted in the greenhouse border and trained to wires or a trellis, it will produce a lovely display. *Clianthus puniceus* is reasonably hardy in the south and west of Britain.

Both species of *Clianthus* have white variants. This is because Anthocyanin formation can be repressed by double regressive combination, which suppresses the colour-forming genes. This only occurs in red and blue plants. The resulting white forms usually breed true, because once a bee has begun to feed on a particular colour it continues to do so for the duration of the trip.

Because of its beauty, Sturt's Desert Pea is one of those plants which has attracted many fabric designers. Jeff Irons informs me that his house had Sturt Pea curtains up as recently as 1989, the fabric being made by Rodriguez fabrics of Melbourne.

PROTEACEAE

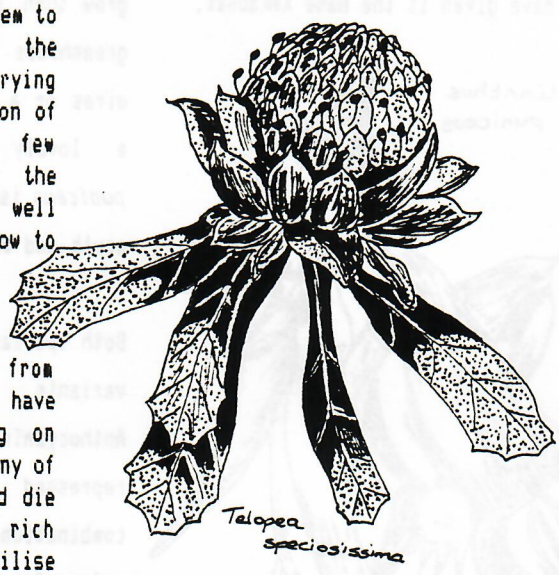
A small number of Proteaceae are available from British nurseries. Do not fall into the trap of thinking that the reason so few can be bought is that most of them are not hardy. It isn't that at all. The real reason is that many of them are difficult to germinate, difficult to grow on after transplanting, and difficult to grow on to flowering size. The ones we see are the easy ones. Anyone who doubts that should read Graham Sumner's article in the April 1990 Newsletter. In some ways we seem to have lost knowledge since the 1800's. Still it is only by trying that we learn, and the intention of this note is to give a few fundamental details to the uninitiated. Proteaceae are well worth the effort of learning how to grow them.

Proteaceae are very different from other plants in that they have evolved a system for living on phosphorus deficient soils. Many of them exhibit phytotoxicity, and die if put into a phosphorus rich environment. They appear to utilise phosphorus through what are called Proteoid roots. If a healthy pot grown plant is removed from its pot, a mass of short white roots will be seen. They are the proteoid roots which enable the plant to extract phosphorus from poor soil. Only 3 members of the family are known not to have them. All three come from high, wet areas. Presumably the conditions are such that they do not need proteoid roots.

Proteaceae are not plants of very arid areas and they do need a reasonably moist and fertile soil. It used to be thought that many of them, Telopea in particular, had an association with Mycorrhiza. Now people are not so sure. However there is nothing to be lost by sprinkling a little soil from around an existing member of the family onto the top of the compost of each transplanted seedling.

They also need a reasonably constant moisture level. Jeff Irons comment on the front of the November 1990 Newsletter tells what can happen if they are kept wet.

They require freely moving air. This is very important at the seedling stage. What appear to be well established plants will die in autumn if they are not given a buoyant atmosphere.



If growing plants from seed, it may be desirable to give them a rather higher temperature than usual, 20 to 25°C instead of 15 to 20°C. Do not sow too early, as no advantage will be gained if the seedlings cannot be kept growing. The seedlings should be transplanted as soon as the radicle can be seen, and there is some advantage in sowing just one seed to each pot. The young seedlings are very susceptible to fungus diseases. Close attention to hygiene is essential.

Both pot and established plants should be fed with low phosphorus fertilisers. A number of formulations exist. A typical one is 7 - 9 month Osmocote, N:P:K 18:1.6:8.7. Jeff Irons uses either equal parts of Rose Sangral and one of the Chempak zero P fertilisers, or 140 day Ficote 16:10:10 on his pot plants. Plants in the ground are never given fertilisers.

The basic requirement for seed compost is that it should be free draining. Some Australian growers use just coarse sand. Others use mixtures incorporating other ingredients. Two typical recommendations are:

Capillary Watering

7 parts sand
3 parts perlite

Manual Watering

7 parts sand
3 parts peat

Perhaps the best known among the Australian Proteaceae is *Telopea speciosissima*. It is not a good choice for a British garden. Paul Matthews of Ness Gardens tells us that only twice has he seen it outdoors. Once was in Galloway, where it was wedged against a boiler house wall. The other was on one of the Western Isles of Scotland. His own attempt at growing about a hundred plants from high level seed resulted in 100% loss over 3 years. When at Kew, Brian Halliwell found that the easiest to grow was *T. truncata*, followed in descending order by *mongaensis*, *oreades* and *speciosissima*. The Tasmanian waratah *T. truncata* has its problems too. There is a large specimen in the Hillier Arboretum which flowers regularly, but seedlings are difficult to establish. They seem to need to be kept cool, and to be given a moist buoyant atmosphere. On the whole *Banksias* are much easier. The hardiest is undoubtedly *B. canei*. All have a particular requirement for good drainage, especially around the collar. The chief enemy of Banksias is Phytophthora cinnamomi, the Cinnamon Fungus. *Lomatias* present no particular problems provided they are given excellent drainage.

HOW I GROW PROTEACEAE by Noël Kingsbury

Proteaceae have a largely undeserved reputation for difficulty. This bad publicity is a shame as they provide some of the most spectacular plants for a conservatory or cool greenhouse. Anyone interested in Australian plants should certainly have a go at the smaller Banksias and Dryandras, or even some of the larger ones if they can be kept to size with regular pruning. Personally I grow Banksias for their foliage, the flowers being a bit too like plastic toilet brushes for my refined taste. Some species will flower in 3 years from seeds, others may take up to 10.

Grevilleas are very colourful, but in my experience and that of others, they are very susceptible to winter damp in a way that Banksias, Hakeas and Dryandras are not. Hakeas are reasonably easy but have the disadvantage that they are nearly all large plants, without the saving grace of having especially interesting foliage.

PROPAGATION FROM SEED

Banksias, Dryandras, Hakeas and Grevilleas all germinate very easily from seed, from 3 to 8 weeks, with a success rate of 50-80%. They transplant as easily as anything else and I have no problems in growing them on. I do know of many growers who do experience problems with keeping seedlings however. Hygiene is important as they are susceptible to some damping-off-type fungi.

COMPOST

Australian Proteaceae are adapted to make the best of very poor soils. The Banksias, for instance, have specially adapted roots [Proteoid roots] for extracting the maximum available nutrients from the soil. It is not surprising then that some species, like orchids, are apparently highly sensitive to 'normal' nutrient levels, basically of phosphorus, a scarce element in much of Australia. I use a basic mix of Irish moss peat and grit/perlite, the proportions are not crucial, although a minimum of 25% grit is probably advisable for good drainage. They will grow well in this for some time, until they do run short of nitrogen, shown by slow growth and pale leaves. Dried blood is a good safe source of extra nitrogen and can be applied during the growing season.

I have been experimenting with using composts with some balanced Osmocote slow-release feed for Proteaceae over the past year. Grevilleas and Hakeas seem ok, and so far so good with the Banksias and Dryandras I have tried. I think the important thing is caution; do not give them the same level of feed as you would other plants; keep the phosphorus low and use organic sources if possible. As with orchids, a good flush through with plenty of water now and again to leach out concentrations of chemicals might be an idea. With adequate nitrogen they are nearly all fast growers.

WATERING

Give them plenty during the growing season, the nineteenth century literature is insistent on this, saying that they do not take drying out at all well. During the winter I keep them almost completely dry. I do not actually know how important this is. It may just be me being neurotic.

As Australia is short of limestone, a soft water regime would seem to be sensible, although I do not think they are lime-haters in the way that Ericaceae are.

TEMPERATURE

They love the heat, unlike their South African relations, the Proteas, which seem to resent it. In the winter I just keep them above freezing, which seems fine for most species. However I have had some problems with severe leaf drop with 2 or 3 species over the winter. It is a bit of a mystery as it does not seem to be particularly related to cold or moisture levels.

RECOMMENDED SPECIES

BANKSIA SPECIOSA, 2m [6ft], popular in the nineteenth century for its remarkable foliage, long, narrow and toothed. I find it suffers from the winter leaf drop mystery, but Bristol University Botanic Gardens, where there is a good collection of Proteaceae, have had one planted out in a glasshouse growing well for years.

BANKSIA BLECHNIFOLIA, 30cm [1ft], reasonably vigorous and easy and very weird. Basically it looks like it's made out of offcuts of suede leather that have been stuck in the ground.

BANKSIA DRYANDROIDES, 60cm [2ft], another early nineteenth century favourite, when it was used for dinner table decoration. A compact grower, it has very fine toothed foliage, creating a light and delicate appearance.

BANKSIA PTERIDIFOLIA, 30cm [1ft]. So fern-like, I get constantly asked whether it would like to grow on the north wall of the house. Somehow I doubt it. It forms clumps of leathery toothed leaves with young growth most attractively covered with red-purple fur, slightly reminiscent of that horrible tropical foliage plant I can never remember the name of, but which sounds like gonorrhoea.

GREVILLEA 'CANBERRA GEM' [G. sulphurea x rosmarinifolia]. Pretty well hardy, this is a classic example of a hybrid being far better than either parent. It is vigorous and has a long season of rather translucent looking red flowers starting in May. Not too fussy about soil, so long as it's well drained and not not solid chalk. Will reach 130cm x 130cm [4ft x 4ft] in 3 years.

BOOK REVIEW by Brian Halliwell

FLOWERING PLANTS OF NEW ZEALAND by Colin Webb, Peter Johnson & Bill Sykes
published by D.S.I.R.; pp146 illustrated; $NZ40.

This book was produced by the 3 authors [who are on the staff of its Botany Division] at the direction of the Department of Scientific and Industrial Research as a contribution in 1990 to New Zealand's sesquicentennial year.

In the introduction is information about plant classification, evolution of native plants with their high endemism [85%] and New Zealand's geological past. A chapter of plant characters follows, whilst the rest of the book deals with 52 plant families : 41 Dicotyledons and 11 Monocotyledons.

Apart from the largest families, *Compositae, Leguminosae* and *Orchidaceae* there is a single page of general information with each family and a second page of illustrations. Each page has a title in large print : a common family name eg. Mint family under which appears the botanical family name[s] eg. *Lamiaceae* and *Labiatae* broken down into syllables for ease of pronounciation. In a box entitled 'family statistics' there appears 'number of species in the world', 'native genera in New Zealand', 'native species in New Zealand and naturalised species in New Zealand'. The second box is entitled 'family characteristics' with numbers of : sepals, petals [whether separate or joined], stamens, styles, position of ovary and whether flower is regular or irregular. In the general information are many interesting facts about species and genera including common names whether English or Maori, poisonous species, method of pollination, habitat, if a plant[s] is dioecious, plant uses, and those which are garden worthy whether native or alien.

A few illustrations in the first two chapters are diagrammatic but the rest are of colour photographs excellently reproduced, which include : species in the wild, close-up of flowers and/or fruits and occasionally plant material of exotic species which are commercially important.

Some common names have no botanical equivalents eg. pineapple scrub. To a novice New Zealander interested in his/her native flora this information would be educational but to enthusiasts in other countries common names would be meaningless. One reads that there are 3 native species of the genus *Solanum* in New Zealand. Two of these have common names of Poroporo. An illustration of one is captioned *S. lacinatum*; what is the other? The family which we used to know as *Liliaceae* has been split up under a reclassification not yet universally accepted. In this book the Cabbage Tree Family formerly in *Liliaceae* becomes *Asphodelaceae* with which are included : *Cordyline, Arthropodium, Astelia, Collospermum* and *Bulbinella*. I know *Cordyline* under *Agavaceae; Arthropodium* under *Anthericaceae, Astelia* and *Collospermum* under *Asteliaceae* and only *Bulbinella* in *Asphodelaceae*.

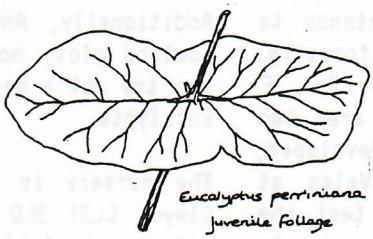
This beautifully illustrated book is written for people interested in New Zealand's flora, it is not intended as a garden book. It can be read and understood without having a scientific mind or botanical training. I cannot remember when I enjoyed a book about another country's vegetation so much.

SPINNING GUM By Brian Halliwell

Only a few species of the Australian genus *Eucalyptus* are hardy in the British Isles. As all are fast growers and, with one exception, eventually make medium to large trees, they need plenty of room for development. One of the smaller is *E. perriniana* from NSW, Victoria and Tasmania, which with annual pruning can be kept small enough for a suburban garden.

Eucalyptus have two stages of development : juvenile and adult, in which growth can be completely different. So dissimilar are these in *E. perriniana* that the uninitiated might think when seeing juvenile and adult plants that there were two different species. Round juvenile leaves which encircle the stem are thin, whitish or silvery blue-grey and are held horizontally. When adult, petioled leaves are alternate, pendant, thick, grey-green and lance- or sickle-shaped. Between the two stages are a number of intermediates. The round juvenile leaf becomes oval and each half elongates until it becomes obvious that it was two opposite leaves joined at their base. Eventually there will be two separate leaves and the opposite arrangement will become alternate. Leaves continue to change, becoming narrower, thicker and developing petioles until they are pendant and lance- or sickle-shaped. The length of time that *E. perriniana* remains juvenile varies from a few to many years; some forms may never become adult. Adult growth can be changed back to juvenile by pruning.

As flowers are insignificant, the beauty of this plant is the prominent juvenile leaf ; of unusual form and attractively coloured. Juvenile foliage makes a useful foil for cut flowers and is sometimes sold by florists for use in floral arrangements. Foliage can be taken off bushes at most times of the year, but avoid spring when growth is new. There should be an annual pruning in late winter or early spring ; cut back hard all stems to almost ground level or to a trained framework. This hard pruning if carried out annually will produce a shrub from 1½ - 3m [5-9'] in height and 1 - 1½m [3-5'] across.



Eucalyptus are easily raised from seed which is the only means of propagation. Sow thinly on a well-drained lime-free compost in February or March and place the container in a frost-free house. As soon as the cotyledons have expanded, pot each seedling separately into small containers using the same compost. Expose seedlings to maximum light and avoid stagnant air conditions. Plant out into their permanent positions in May of the same year when the danger of frost is past. Do not worry if the seedling is only a few inches high for at this size and when not rootbound, it will quickly establish and by the end of the year may have produced a stem 1m [3'] in height. Before new growth begins in the following spring, reduce the stem by half. In subsequent years, either train in a framework or cut all stems back to within a few inches of ground level.

If leaves encircle the stems what happens when they die? In petioled leaves, at leaf-fall the petiole becomes detached and the leaf falls to the ground. When a juvenile leaf of *E. perriniana* dies, its tissues dry, shrink and break away from the stem to slide down to its base. Eventually a collar of dead leaves will accumulate and when a wind blows, these leaves rise up and spin madly round. It is this condition which has produced the common name of spinning gum for E. perriniana.

RAUHUIA — A FLAX FROM NEW ZEALAND

by Brian Halliwell

In Britain there are 3 species of *Linum* in the family *Linaceae* ; *L. bienne*, pale flax, *L. perenne*, perennial flax and *L. catharticum*, purging flax. It is from *L. usitatissimum* that fibres are extracted for the manufacture of linen whilst the seeds provide linseed oil. New Zealand flax refers to *Phormium tenax* and *P. colensoi*, formerly in *Liliaceae* but now reclassified into *Phormiaceae*. These plants take their common name from the coarse fibre taken from their leaves which has been used in the manufacture of binder twine. New Zealand does, though, have one representative in the genus *Linum*, *L. monogynum*, which has the Maori name of Rauhuia.

In the wild *L. monogynum* has a wide distribution occurring in most parts of the main islands, from coastal districts to submontane areas. There is a stout rootstock from which arises many thin upright stems which can reach, even exceed, 300mm [12"]. These stems carry alternate leaves which can be narrow, oblong or lanceolate varying from 12.5mm - 18mm [½ - ¾"] in length. During summer there develops a many flowered cymose inflorescence of upright cup-shaped flowers 18mm - 25mm [¾ - 1"] in diameter, composed of 5 broad white partially overlapping petals.

In English gardens this plant has a reputation of being tender and yet once established, it will survive all but the most severe winters. No doubt if the seed source is from a submontane area in the south of the South Island, plants will prove to be hardier than when raised from seed collected on the coast in the North Island. Although sometimes grown on a rock garden, it is rather too tall and is better at the edge of an herbaceous border, island bed or mixed border. It seems tolerant of most soils as long as these are well drained. Propagation is easy from spring sown seed with resulting seedlings potted and kept under protection for permanent planting in the following spring. Division of not too aged plants can be carried out as plants start into growth.

EUCALYPTS IN CLWYD

Celyn Vale Nursery is the only one in Britain which specialises in Eucalyptus, and its glossy lists are familiar to many gardeners. What makes Celyn Vale different from Taudevin's, which was the Eucalyptus specialist 40 years ago, is that it is seeking to select and grow only the hardiest forms of each species. Andrew McConnell, the owner, uses selected collectors including a retired CSIRO forester, to procure seed from high open places. His range is wide and each species is culled of seedlings which are not true to type. At present they are grown in Rootrainers, but for 1991 a new type of container which should give even better aerial pruning is to be tried. Acacias have been tried too. As expected they are not very hardy, and Andrew McConnell intends to concentrate on Eucalypts suitable for forestry. In particular *E. pauciflora ssp. debeuzevillei*, *E. fastigiata* and *E. fraxinoides*. In this area two interesting lines of research are being developed. The first is that the University of Wales at Bangor is using fluoresence analysis to test the hardiness of seedlings. The technique seeks to measure the fluoresence of chlorophyll in leaves and to simulate the effect of nightfall by lowering the temperature at a rapid rate. Measurement of fluoresence should make it possible to detect when photosynthesis stops.

It is one thing to select the hardiest eucalypts, but it is another to propagate from them. Eucalypts are notoriously difficult to propagate vegetatively and here Celyn Vale Nursery has enlisted the assistance of Wye College of Agriculture. Some work has been done using micropropagation, but the real hope lies with protoplasmic fusion. In this, genes from a good timber species will be combined with those from a very hardy species, and the eventual new species grown on for testing.

Additionally, Andrew McConnell is looking for a lowland plot, not too far from Carrog, where he can try out a new Australian method of growing on Eucalypts.

The nursery is at Allt-y-Celyn, Carrog, Corwen, Clwyd, LL21 9LD and is just off the A5 a few miles west of Llangollen. Plants can be obtained mail order. Not very far away is Dibley's Streptocarpus Nursery [Efenechtyd Nursery], which is at Llanelidan, not at Efenechytd.

USELESS INFORMATION

Sudden temperature drops are usual in S and SE Australia, especially in Adelaide. Hot air from the interior moves south, and after only one day is pushed back by cold air from the south. Temperature changes of 30°F in 15 mins are frequent. Jeff Irons remarks that he once experienced 92°F to 60°F in 12 mins, also 100°F one day and 52°F the next.

When the temperature gets too high, the ripe oranges, still on the trees, turn back to green with a protective chlorophyll coating that stops sunburn.

PROPOSED NAME CHANGES

A paper in 'The Plantsman' for December 1990 [vol 12 No 3] proposes that Pernettya and Gaultheria be merged. We wait with interest to discover whether the recommendation is adopted. The changes proposed are :

New Name	Present Name
Gaultheria lanceolata	Pernettya lanceolata
Gaultheria macrostigma	Pernettya macrostigma
Gaultheria nubicola	Pernettya alpina
Gaultheria parvula	Pernettya nana [Colenso]
	Pernettya tasmania [Hooker] var neozelandica [Kirk]
Gaultheria tasmanica	Pernettya tasmanica

ALYOGYNE HUEGELII

The family name Alyogyne comes from the Greek alytos - united and gyne - woman, and is a reference to the undivided style.

The family was separated from *Hibiscus* and is endemic to Australia, having about four members. They are all fast growing shrubs with mallow-like flowers. One of them, *Alyogyne cuneiformis*, was a popular conservatory plant in Victorian times. Another, *A. huegelii*, is now being promoted by the nursery trade for the same purpose.

Native to the Mount Lofty Ranges in South Australia, and to the adjacent part of Western Australia, it is an upright medium-sized shrub with bright green deeply lobed leaves. Like many other fast growing shrubs, it is a straggly grower unless pruned. The flowers are usually white, yellow, or mauve; but the strain being marketed now is described as being light blue. Noël Kingsbury of Sunbeam Nurseries has grown and sold this plant for some years. He comments that if pinched back it is a good conservatory plant. Noël adds that *A. 'Santa Cruz'*, marketed by Jean Rey of Carpentras and Hopley's, also Read's of Loddon, looks to him to be just the same as ordinary *A. huegelii*.

Noël Kingsbury believes that *A. hakeifolia* is a better plant. It has light mauve flowers with a reddish central blotch, arising from broom-like foliage. The contrast between ascetic linear leaves and exotic hibiscus-type flowers is a very valuable and distinctive feature. Its cultivation is as for *A huegelii*. It too has a yellow variant, but the 'normal' form is a more attractive plant.

COMPOSITAE OR ASTERACEAE?

Members will have noticed that the name Compositae is never used in this Newsletter. Plants in the daisy family are always referred to as Asteraceae. The family was originally called Compositae because its members have composite flower heads. The alternative name of Asteraceae was introduced by botanists to bring the family into line with current practice, which is that the name should be derived from a species in the family, and that it should end in eae. Familiar though it is, Compositae has had to be dropped.

BRACHYCOME OR BRACHYSCOME?

The Swan River Daisy is a popular annual in Britain. Seed catalogues refer to it as Brachycome. 'The Plantfinder' calls it Brachyscome. Which is correct?

Cassini [1817] published the generic name *Brachyscome*, and cited Labillardiere's [1806] *Bellis aculeata* as *Brachyscome billardieri* for the type species; it was the only species then known in the new genus. Cassini [1825] altered the generic name to *Brachycome*, again citing *Bellis aculeata* as the type species. The later spelling was adopted by subsequent authors. A proposal to conserve the later name was not accepted by the Special Committee for Phanerogamae [1954], and so the correct spelling of the genus must be considered to be *Brachyscome* [Eichler 1965]. It will be used in all APS Newsletters.

This newsletter has been produced by Sue Hyams. Contributions are now needed for the November Issue. Please send them to Jeff Irons [address elsewhere].