

Australian Plants

Registered at G.P.O., Sydney, for transmission
by post as a periodical.

DECEMBER, 1964

Vol. 3, No. 21
Volume 3 will comprise issues No. 21-28.



Colour photography by Frank Hurley

Block by courtesy of John Sands Pty. Ltd.

BRIGHT CONE SHAPED FLOWER HEADS OF GREVILLEA ERIOSTACHYA (see page 47).
This issue describes many Grevillea for the garden, some species known as "Spider Flowers."

● Bottle Brush flower heads of *Melaleuca steedmanii*. See page 44.

WHAT IS THIS BOOK ABOUT AND WHY?

Introduction to Volume No. 3—

"Australian Plants" is produced by a group of Societies from each State of Australia whose members come from all walks of life in the community, but who all have a love of flowers, in particular, the wildflowers of Australia. The objective of the publication is to encourage their preservation in the wild and their planting in public and home gardens.

Growing Wildflowers?

Under correct conditions, many make excellent garden subjects. Each issue describes the conditions most desired for the plants described. Generally speaking, garden conditions that are good for the usual exotic garden subjects are ideal. A good drained soil with protection from extreme conditions will grow most of the more beautiful natives. General maintenance differs only in that the soil should not be cultivated or limed and fertiliser applied only sparingly. Pruning after flowerings is also important. Every issue gives full instructions.

By following the simple instructions given every amateur gardener can grow wildflowers. As in past volumes there will be special issues for problem applications such as clay or heavy soil areas, arid conditions, wind breaks, etc.

Where to Obtain Wildflowers?

Definitely not from the bush. If the plants survive, which is very unlikely, they will rarely prosper. Each issue lists competent nurserymen who have for sale plants propagated from the best forms of wildflowers that have proved adaptable to garden conditions.

Why not propagate your own? Seed is easily obtained quite cheaply and simple and reliable methods of germination are given in each issue. Good success with most species is assured.

Which Wildflower is That? What is its Name?

Here lies one of our problems. There are thousands of wildflowers. The use of common names often leads to much confusion and botanical names often scare off beginners. This issue features the Grevilleas. There are about 240 species. One group are called "spider flowers", another group has toothbrush-like flowers while still others, cone shaped flowers. Botanically they are all given a collective or generic name of *Grevillea* as each small flower that comprises the whole flower head resembles a clenched fist with a raised index finger.

Because of the magnitude of the task of classification, amateur readers must please be patient with those sections devoted to botanical classification of species. One day their experience or curiosity will be such that they will want to know what is the difference between two species and how to identify them. Without this system there would be chaos and after all what publication has only articles all of studied interest to readers?

OUR PUBLICATIONS . . . AVAILABLE FROM EDITOR BY MAIL ONLY

360 Henry Lawson Drive, Picnic Point, N.S.W. — Please be patient for a reply.
AUSTRALIAN PLANTS Price 3/-
 The annual subscription of 12/- includes postage of the next 4 issues to your home. Past issues 1-8 & 13-19 are available as individual copies at 4/- plus 5d. postage. Some issues 9-12 are out of print and are available only in the bound volume.

AUSTRALIAN PLANTS — Volumes 1 & 2 Price £3/0/0 each plus 2/- postage
 The issues in Volume No. 1 (1-12) and Volume No. 2 (13-20) have been bound in separate books. This beautiful gold lettered, hard covered bound book includes *The Language of Botany* Volume 1 with 350 pages, 75 sketches and 45 full colour plates is exceptional value and stocks will soon be exhausted. Volume 2 will be available in bound book form in February.

THE LANGUAGE OF BOTANY Price 4/-
 This 60 page booklet defines thousands of botanical terms for reference by the amateur or student botanist. Originally intended for our laymen readers, it is now accepted as a reference book for University Students.

BINDERS Price 12/- plus 1/- postage
 For filing issues of Australian Plants—plastic covered stiff cover—gold lettered.

GREVILLEAS

Patrick Stanley, Canisius College, Pymble, N.S.W.

"Grevilleas are amongst the easiest of plants to grow." This quotation is from a periodical, *The Garden*, 1882. It would be interesting to know to which Grevilleas the old gardener was referring, for there are so many. Not all are easy to grow, but they are among the most fascinating of Australian plants.

Grevilleas were named after Charles Greville by botanist Robert Brown. Greville was a vice-president of the Royal Society, and a patron of botanists. Grevilleas are closely related to Hakeas, Waratahs, etc., and to the South African Proteas, from which the family Proteaceae takes its name. The individual flower resembles a clenched fist with the index finger raised. This raised finger represents the style, the pollen being carried on the stigmatic surface of the extremity of the style. The cone-shaped arrangement of these flowers in the Waratah is well known. In some Grevilleas there is an arrangement similar to a tooth brush, while the grouping of flowers in some common Sydney species gives us the popular name of "spider flowers."

Grevilleas, with about 240 species, are almost exclusively Australian; a few, however, are found on adjacent islands. None is found in New Zealand.

It is well known that they range from tall trees, *G. robusta*, to prostrate plants, *G. laurifolia*; but the subjects treated here will be mainly garden plants.

COLOUR RANGE OF GREVILLEA FLOWERS

Grevilleas are plants with outstanding possibilities. They have a range of colours hardly exceeded by any other genus of Australian plants. Red is the predominant colour, and that seems true of Australian plants in general. A very common Grevillea around Sydney is the red *G. punicea*.

GREVILLEA BANKSII

A Report from the Australian Cultivar Registration Authority

In the light of the results of recent research, the members of the Authority respectfully wish to draw your attention to a misnomer which appears on Page 80 of the June, 1963 issue of the magazine, "*Australian Plants*."

It has now been established that the name "*banksii*" actually refers to the red colour form, thus rendering "*variety fosterii*" superfluous, so that it should not be used. The cream variety has apparently been designated as the "*variety alba*."

J. H. Willis, *Chairman*

A Queenslander, *G. banksii*, has settled well into garden conditions here, and would probably be, with *G. rosmarinifolia*, the commonest garden-grown Grevillea in Sydney. *G. wilsonii* from West Australia is red also, but a quite different red from the above.

A local white species, *G. linearifolia*, is common around Sydney, while a short leafed form from Heathcote, N.S.W. has possibilities as a garden shrub. There are many West Australian species which have been used in gardens in the East, such as *G. brevicuspis*, *G. triloba* etc. Again, a local one, *G. sericea*, will do for the mauve group; indeed, it could represent the pink and extend almost to purple, with its multiplicity of forms. From the Blue Mountains area come *G. acanthifolia* and the rare *G. asplenifolia* var. *shepherdii*, both mauve and of the tooth brush group.

G. mucronulata from the vicinity of Galston Gorge and extending to the Blue Mountains area represents the green flowered Grevilleas. Some good forms of this peculiar species are to be found; perhaps the mountains have the more showy forms. It is worth noting that this flower seems to defeat



Colour photography by Frank Hurley

Block by courtesy of John Sands Pty. Ltd.

GREVILLEA PUNICEA — THE RED SPIDER FLOWER

it own purpose, for green is the most unusual of floral colours, merging, as it does so well in this species, with the green leaves. The whole purpose, we have been told, of the colourful flower is to attract a pollinating agent in some cases insects, in others birds. With Grevillea the agent is more likely to be a bird. A bee, for instance, could go to the nectar at or near the base of the style without touching the pollen at the tip

of the style. The pollen has to be brushed off or added to at the appropriate time to cause the setting of fertile seed. However, *G. mucronulata* succeeds in setting fertile seed as was well illustrated in our Sydney September show with a specimen from Glenbrook, N.S.W. This small branch carried flowers and a plentiful supply of well developed seed.

Coming from the Brisbane Ranges out from Geelong, in Victoria, and near Bacchus Marsh, is a golden or yellow flowered *Grevillea*, *G. chrysophaea*. Inland N.S.W. is the home of *G. juncifolia*. Mr. G. W. Althofer, pioneer Australian nurseryman, whose contribution to Australian Plants and their preservation is unique, writes of this species as "The beautiful orange flowered inland species. Flowers held high above foliage like golden candles. I have had no success with this species near Sydney. Better fortune, however, has attended another golden flowered species, *G. pteridifolia*, a Queensland shrub. This species seems well suited to Sydney where it prefers a sunny to a shaded situation. Mr. J. H. Willis, in the *Australian Encyclopaedia*, has this to say of it: 'It is a magnificent small tree of river banks and seasonal swamps in the tropics. Its pleasing ferny foliage and great profusion of golden flowers render it one of the most decorative plants to be seen in the Northern Territory.'

Blue is about the only colour missing. But is it missing, A very rare N.S.W. species, *G. shiressii*, is that indefinite colour where it is difficult to say whether it is green or blue. An investigation may prove that there are blue forms. If there were a rose of that colour then the blue rose would soon be a certainty.

The colours referred to so far have been mainly a single colour. Consider for a moment the variety of colour combinations, and taking one species alone, *G. alpina* (or *G. alpestris*) let us refer to a Victorian catalogue: 'Scarlet and gold, shell pink to blush, yellow and white, green-white' — and this does not exhaust the colour-range of this one species. No painting would be complete without what Mr. Althofer describes an 'an exquisite dwarf, with pale pink wax-like flowers 9-12 inches high.' That little gem is *G. ericifolia*.

SWEET SCENTED GREVILLEA

Perfume among Australian native plants is generally associated with *Boronias* or *Acacias*. A few notes, therefore, on perfumed *Grevilleas* will not be out of place. I can speak only of those varieties with which I am familiar, and this means that I shall have to pass over a lot of West Australian species.

Starting to bloom, at times in mid-summer, or in early autumn is a form of *G. parviflora*, reputed to come from the Quantong cemetery area near Horsham, Victoria, but apparently not found there now. The shrub is naturally well-shaped about three feet high, and carries masses of small white flowers. It has a sweet, honey-like perfume, and the advantage of blooming when few other natives are in flower.

As it bows out another *Grevillea* is taking over, one of a group of white flowered *Grevilleas* from West Australia which are closely related and which have been referred to previously as *G. tridentifera*, *G. paniculata*, and *G. biternata*. The nomenclature of these is very complicated, so until botanists have decided their exact relationship, I shall refer to them as the sickly-sweet, the cinnamon-scented, and the prostrate white scented *Grevilleas*. There is no doubt about the perfume from the first of these three. On a warm still day in winter, you can detect it a stone's throw away. Two shrubs have this strong sickly-sweet odour at close quarters. One grows to about six feet in height with a spread of the same distance, and is about

5 years old. The foliage is trident-like, somewhat prickly, but quite attractive. The other shrub is only about three feet high, and adopts a squat habit. Both these Grevilleas should be flowering in late July if planted in a sunny position. They have a creamy-white inflorescence, and the flowering is profuse. Passing by the shrubs, or at a distance, the perfume is not unpleasant; but in a confined space it becomes sickly-sweet.

Coming into flower at about the time these two are past their best is another Westerner. The foliage is rather similar to those just described, but finer and softer, and of a golden green colour. It is a very handsome shrub even when not in bloom, growing to about 5 feet in height. However, in full flower, in mid-August, it is a creamy-white cloud filling the air with a sweet cinnamon-like perfume. This shrub takes well to pruning, even drastic cutting back. Thus it can be kept to a compact shape. A six year old shrub growing here is about five feet tall and well shaped. It is quite a hardy shrub with distinct possibilities as a lawn specimen.

Another shrub from the West, and this one a smaller shrub, only about a foot high, is *G. acerosa*. The flowers coming in early August are a greyish-white colour, and smother the otherwise unpretentious little needle-leaved bush. It is a striking transformation, as if a soft grey veil had been draped over the shrub. The perfume from the blossom is very sweet; it, too, has been likened to honey, but it has a sort of indefinite sweetness — a blending of the scented elements of the bush in Spring.

I am grateful to Miss Jean Galbraith, author of *Wildflowers of Victoria* and ambassador at large for Australian wildflowers, for a note on *G. australis*. Miss Galbraith says that she gathered a few flowering sprays of *G. australis* on the Bogong High Plains where they flowered among snow drifts in October. During the day the fragrance was sweet, but at night it was so intense as to render sleep almost impossible.

Mr. J. H. Willis in his valuable reference to Grevilleas in the *Australian Encyclopaedia* says that *G. australis* is the only Grevillea found in Tasmania.

A prostrate white flowered Grevillea is a perfumed species. It has vivid green foliage, and masses of white flowers in August. This Grevillea would be a gem in a rockery. An upright shrub, a form of *G. cuneata* superficially resembling *G. glabrata*, is a scented species. This shrub is hardly ever without blossoms. A form of *G. sericea* collected by Mr. Althofer near Ulan, N.S.W., is very interesting. It was catalogued as *G. linearis forma pumila*, but, as Mr. Althofer predicted, is now regarded as a form of *G. sericea*. A very floriferous mauve flowered bush, about three feet high, it has a very pleasant fragrance. This is surprising. If we exclude a couple of grey ones, it is the only coloured Grevillea I know of that has a perfume. Why this form should be perfumed and not the local *G. sericea* is an interesting point.

GREVILLEA FOLIAGE RANGE

While the colour of the flowers and the perfumes differ, perhaps the greatest difference among Grevilleas is in the type of foliage. *G. pterosperma*, for instance, from the dry inland areas of the East and extending, like the Cassias, to West Australia, has needle-like leaves similar to some of the Hakeas. This shrub has a beautiful silvery appearance, and has been grown successfully in Sydney. *G. barklyana*, from around Jervis Bay, has leaves like a Eucalypt; yet the Victorian form has leaves like an elongated oak leaf. It would be an ingenious person who could devise a form of tripartite leaves not found among Grevilleas. Quite unique foliage is found even among the N.S.W. species, such as the deeply cut leaves of *G. acanthifolia*, and the fern-like leaves of *G. asplenifolia*. Varying again we have the soft

divided leaves of *G. caleyi*. Holly type foliage is exemplified in *G. steiglitziana*, a Victorian species. A West Australian species, *G. hookeriana*, introduces a type of foliage like a fish bone.

SOME GREVILLEA HYBRIDS AND FORMS WITH THEIR REGAL PARENTS

As we are a society for growing Australian plants, let us consider some Grevilleas that would make desirable garden plants. For a brilliant floral display, it would be hard to equal *G. lavandulacea*. It is a small shrub usually, from the drier areas, and many forms are in cultivation. A sunny spot suits it best. It seems likely that *G. 'crosbie morrison'* is of this parentage. *G. juniperina*, a N.S.W. native, is a fine hardy shrub, growing to about five feet in height, and bearing spectacular red, orange or pink flowers. A form commercially known as *G. "pink pearl"* is probably the richest in colour, and is a very reliable garden shrub in Sydney. The now well-known 'Poorinda' hybrids are said to be derived on one side from *G. juniperina*, and have found their way into many gardens. However, Grevillea fanciers will sit up when they see some of the later 'Poorinda' hybrids. Here is what one of the best known Australian plant growers, Mr. W. Cane of Clearview Nursery, Maffra, Victoria has to say: "'Poorinda Beauty' has the flowering type of *G. juniperina* at its best (orange). It also has the advantage of soft grey foliage and more erect habit of growth. 'Poorinda Splendour' is a red coloured form of the above. 'Poorinda Firebird' has the unusual character of flowering profusely on the old wood when heavily cut back. 'Poorinda Ruby' grows to three feet, with red flowers along two foot stems, making one complete dense circular spike, about four inches in diameter. It has to be seen to be believed."

Mr. Cane's own hybrid Grevillea, *G. 'clearview david'* was obtained by crossing the hybrid *G. 'crosbie morrison'* with *G. rosmarinifolia* (North Gippsland form). Mr. Cane says that it was bred for vigour, but has appealed to most people on account of its attractive flowering habits. A Grevillea from Hurstbridge, an outer suburb of Melbourne, a form of *G. rosmarinifolia*, is a fine garden shrub growing to about three feet in height.

GREVILLEA TO GROW

Small plants are always more keenly sort after. Two undescribed Grevilleas, one from near Calga and the other from Mangrove Mountain, both in the vicinity of the Hawkesbury River, are promising garden plants. Both are related to *G. capitellata*, have red flowers and are quite small plants. From West Australia comes *G. brevicuspis*. Now here is a shrub very seldom seen in gardens. In catalogues it is generally described as a small shrub, three feet high. However, given favourable conditions, it will grow higher, and spread to six feet or so. The foliage is very attractive, and, as indicated, small-toothed. In winter, the colour turns from green to almost purple, before the September floral display begins. Then small, creamy-white flowers smother the bush, releasing a delicate perfume.

Again from West Australia we have a small Grevillea with vivid red and gold flowers, like drops of liquid. This is *G. brownii*. Apart from this brilliant sparkle, its chief interest is the exceptionally short style. A Grevillea from Black Mountain, Canberra, has a similar flower, but not quite so colourful. *G. wilsonii* from the Jarrah forests of West Australia is a small shrub with large attractive red flowers, more subdued than the usual 'Pillar box' reds. *G. rosmarinifolia* and *G. punicea* are sturdy plants, and good examples of hard pruning of these plants may be seen in the Sydney Botanic Gardens, near the Kiosk. *G. 'dallachiana'*, a form of *G. alpina*, is very common in gardens and, when kept pruned, is a good little shrub.

G. alpina, *G. rosmarinifolia*, and *G. lanigera* have a variety of forms. Specialist nurserymen dealing with Australian natives are reliable guides, I have found, when seeking advice on those forms best suited for cultivation.

G. baueri from the Dividing Range in N.S.W., with its cerise flowers, always attracts attention. Unfortunately, its soft leaves also attract the caterpillar kingdom and, at times, fungus. If these however, are controlled, the shrub will repay this attention with a display of flowers for about four months, commencing in August. *G. longistyla* from Eastern Australia, and *G. pinaster* from the West are both splendid shrubs carrying red flowers. The latter shrub flowers for most of the year. If space permits, *G. glabrata* is a fine addition to a garden, with its buish-grey foliage and dainty white flowers. I have known a large shrub to be blown right over, and with half the roots being exposed, to go on growing as if this was normal procedure.

PROPAGATION

The usual method of reproduction with *Grevilleas* is by the striking of cuttings, as this is the reliable way to ensure that the new plant is a replica of the old one. Details of the methods used are to be found in those books which are devoted to the cultivation of Australian plants, and in this journal. A very simple method, however, used by Sydney member Mr. L. Sweeney, and suggested for part-time gardeners, is a 50-50 mix of coarse sand and peat moss. This is wetted and the excess moisture well squeezed out. The mixture is put in a clean pot, the cuttings set in it, and the pot is then placed in a plastic bag. This is tied at the top and suspended in a light place, but out of direct sunlight. Watering is not necessary for about three weeks, the conditions simulating mist propagation. Another Sydney member, Mr. J. Wrigley, uses a small fruit case to contain the cutting medium, the box then being wrapped in clear plastic and sheltered from direct sunlight. Quite remarkable success has followed these simple methods. Information on the types of cuttings will be found in the references given above. Regarding the growing of *Grevilleas* from seed, it is not proposed to offer any advice here, but the reader is referred to some excellent articles in "*Australian Plants*," June, 1963.

Most of the *Grevilleas* mentioned here like to grow where they receive a good deal of sunlight. It is a mistake, however, to isolate them where they are at the mercy of strong winds. Certainly, those species growing naturally around Sydney have the protection of low growing scrub. If good drainage is then added to these other requirements, no special difficulties should be met with. At the same time no promise is held out that the growing of these beautiful shrubs is easy.

It is not essential, however, that *Grevilleas* be grown in gardens or parks. For those whose gardens are limited to container-grown plants, *Grevilleas* can offer a surprising range. Four gallon oil drums, if they are well drained, will support quite large plants. It should be remembered, however, that when the plant is well advanced, it will need more frequent watering. Wilting of new growth will indicate this. Waratahs, for instance, can be grown to flowering size in these drums, and the notoriously fickle *Eriostemon lanceolatus* is perfectly at home in this limited amount of soil. A *Grevillea* that you would not expect to adjust itself to these cramped conditions is *G. hookeriana*, which naturally grows to small tree proportions. At the moment (in late July) a plant in a four gallon oil drum has a hundred well developed flower spikes on it. *G. barklyana* (the Jervis Bay form), a younger plant than the former, has sixty swelling buds. Two other tooth-brush types, *G. asplenifolia* and *G. caleyi*, while providing a fine show of foliage, are inclined to go for height, disregarding flowers. *G. ericifolia* just covers the

top of the drum like a pink atomic cloud. The prostrate white scented *Grevillea* referred to earlier flows over the top and down the sides of the drum. A list of others would be monotonous, but experience shows that few species will fail. It seems well in this type of 'gardening' to take the plant along by degrees — small tins, prune cans and then the oil drums. This avoids the situation of a small plant's roots being left floundering in a quantity of unconsolidated soil.

Finally, a word of thanks to Mr. L. Johnson of the Herbarium staff, Royal Botanic Gardens, Sydney for checking the nomenclature of these plants.

And for those who think that *Grevilleas* are "amongst the easiest of plants to grow," let them regard the 'raised index finger' as a beckoning symbol, bearing in mind the words of well-known Sydney wildflower grower, Ross Doig: "Growing Australian native plants is a challenge."

Grevillea for the Garden

by R. DONEY

Being a large genus, *Grevillea* has plants to offer for any garden purpose, espalier, specimen, background, rockery, hedge, ground cover or "fill in." In fact, though not suggested that it should be done, it would be possible to make an attractive garden using only *Grevillea* species, as the vast variety of foliage, form, size, floral colour and production, provide so much choice as to make final selection difficult.

The lengthy flowering period of most *Grevillea* is a solid asset, particularly as many flower throughout the winter. Adaptability to soils and climates, considerable freedom from pest and disease and general hardiness are other factors which contribute to the value of *Grevillea* as garden subjects.

Hybridism, accidental or induced, frequently produces interesting variants many of which are available commercially though the writer considers that few of these hybrids are so outstandingly different as to be found more worthy than the parents. If asked to make a recommendation, my choice would be confined to a few named (officially?) crosses fairly readily available: *Grevillea* x "Crosbie Morrison", *G.* x "Magic Lantern", *G.* x "Pink Pearl", *G.* x "marian", *G.* x "Williamsii", *G.* x "Jenkinsii", and a careful selection from progeny of a nameless accidental cross between *G. caleyi* and probably *G. asplenifolia* which shows some interesting variations in foliage and form from those of the parents. This selection is on the basis that each plant shows at least one characteristic which allows the plant to stand above its parents, but in view of the many fine species of this genus, none of these plants is sufficiently outstanding as to warrant high praise. *In short there are more good species than good hybrids.*

Though the ultimate life span of *Grevillea* species is as yet unknown, quite a number still living are known to me, of ages from 17 to 21 years, a fact that causes me to infer that a potential of 30 years is not too much to expect. Longevity is an important quality for plants performing structural duties in a garden.

As most *Grevillea* produce flower upon young growth, annual pruning after flowering, or a few months prior thereto, will increase the density of the plants form and also induce greater flower production.

Though many grow naturally in sandy loam, *Grevillea* seem to benefit from the greater food and water supply potential to heavier soils containing

clay, provided the structure of the soil is good, i.e. friable and not "tight." Some West Australian *Grevillea* will quickly die apparently from a dramatically fast fungus growth occurring during and subsequent to, over wet soil conditions.

A few *Grevillea* are subject to scale attack and consequently "sooty mould", but this occurs usually only when the plant is not growing freely. Thus it pays to fertilize.

Cool poultry or cow manure may be used, or a packeted fertilizer of no greater than 5% nitrogen content should be used. Feed in spring with possibly a light feeding in early autumn.

Of the many *Grevillea* species which can be used, the following list is compiled with a view to availability and variety, but must not necessarily be considered as a "best selection." Species mentioned elsewhere are omitted.

Grevillea amplexans (F. Muell.). A large shrub 6-10ft. with glabrous and often glaucous orbicular to cordate, somewhat prickly leaves. Flowers are white in great profusion.

G. asteriscosa. A little known shrub of good form and attractive appearance with dark green hairy and prickly leaves resembling an asterisk in shape. Flowers brilliant red.

G. barklyana (F. Muell.). A variable shrub 8-10ft., flower pale red to pink, with attractive oblong-lanceolate leaves 4-10ins. long and often with several lobes.

G. baxteri (Br.). A medium shrub 4-6ft. high and wide with stiff dark green divided leaves and brilliant red tooth-brush flowers.

G. biternata (Meissn.) A vigorous prostrate plant sometimes with some ascending branches to 18ins. or so with narrow-linear divided leaves of light green and a profusion of creamy-white flowers. A valuable cover and rockery plant, fond of water but sensitive to poor drainage.

G. caleyi (Br.) An open, almost straggly medium to tall shrub 12ft. high and across with flexible branches which lend themselves to espalier work. Leaves deeply pinnate or pinnatifid, grey-green and densely villous. Flowers dull but not dark red "tooth-brush" racemes 3-4ins. long. Appreciates deep, well drained but moist soils.

G. capitellata (Meissn.) A variable shrub sometimes dense low and rounded, sometimes taller (to 5ft.) and "rangy". Leaves most often linear-oblong, midgreen often with red margins. Dense short racemes of dark red flowers borne on slender and sometimes rather long peduncles. A form which occurs near Gosford, N.S.W. is probably the most valuable.

G. confertifolia (F. Muell.) A small rounded shrub 3-4ft., with dark green narrow-linear, small leaves and red flowers.

G. crithmifolia (Br.) A spreading shrub of variable height 2'6"-8'. Small leaves, hairy and crowded, narrow linear and pinnately divided presenting a grey-green appearance. Dense masses of creamy flowers producing much nectar with a somewhat foetid odour.

G. didymobotrya (Meissn.) A shrub or small tree, 10-15ft. with dark green slender leaves covered with minute silvery hairs which reflect light. Racemes terminal in erect cones of pale yellow. A lovely plant.

G. ericifolia (Br.) A charming dwarf plant, 1-2ft., with light green small and narrow leaves and delicate wax-pink flowers.

G. floribunda (Br.) An excellent brown and yellow flowered shrub of 4-6ft. with dull green hairy oval-oblong leaves. Likes well drained deep moist soil.

G. integrifolia (Meissn.). A lovely shrub with handsome oblong-cuneate, silky-hairy, shining leaves and rich yellow flowers. Good form 5-8ft.

G. miqueliana (F. Muell.). A lovely foliage plant with good red flowers favouring cool areas. 5ft.

G. obliquistigma. A lovely fine leaved plant of good form and cream-yellow flowers from W.A. Hardy and growing to 8-10ft.

G. vestita (Meissn.) A usually rounded shrub, 5-8ft., leaves grey-green, with white flowers in immense quantity producing much nectar.

GREVILLEA AS GARDEN SPECIMENS

by E. M. M. BODDY, Eastern Park Nursery, Geelong

The Grevilleas are so numerous and such an interesting and satisfactory group of Australian plants, that they could have been selected to represent Australian native flora with advantage.

The common name (Spider Flower) applies to many varieties, but in time some one will devise a common name that will be more suitable.

It is unfortunate that the species was introduced into gardens through the species *Grevillea rosmarinifolia*, which although extremely hardy and a good hedge plant, has had very little to recommend it from the point of view of flower. *G. rosmarinifolia* var. *jenkinsii* and a seedling developed by Mrs. Woolard, a member of Melbourne S.G.A.P. are both more commendable plants.

The Grevilleas attract the honey eaters, and in particular the New Holland honey eater and the Wattle bird, which gives an added attraction to the garden by their presence throughout the year.

The majority of the Grevilleas are adaptable and hardy, but there are still some West Australian varieties that are difficult to grow unless the drainage and soil conditions are right.

Many varieties of Grevilleas are long flowering, and good winter flower may be anticipated from a large number. They are hardy plants which respond well to cutting back, and they do not attract scale.

The habit of growth is such that they may be grown as ground cover plants, low, medium and tall shrubs, and *Grev. robusta* as a tall tree. I am informed that *Grev. banksii*, in its red and white forms has been developed in Queensland Streets as a small tree.

As I write we are in the last week of June and the following varieties in our own plantations have a show of flower or are in full bloom.

TALL GREVILLEAS WINTER FLOWERING—

Grev. leucopteris 6'-8'. Creamy white plumes of flower on long stems. Ashen grey, long narrow foliage. Requires well drained soil.

Grev. petrophiloides 4'-8', large bright cerise bottle brush flowers on long stems, fine mealy grey green foliage. Requires well drained soil.

Grev. tripartita 6'-12' long red and yellow flowers, short prickly light green foliage, previously known as *G. macrostylis*, which has a similar flower, but dark green holly shaped foliage.

Grev. juniperina rubra 4-8' bright wheel shaped clusters of flower, short and slightly prickly dark green foliage.

Grev. stemomera 6'-12' large sprays of lacey red flowers, long and narrow dark green foliage, a very vigorous plant.

Grev. banksii 6'-12', large erect cream flower heads. Foliage resembling that of *Grev. robusta*. Requires protection from frost.

MEDIUM GREVILLEAS WINTER FLOWERING—

Grevillea hybrids "Poorinda", "Queen", orange to apricot flowers,

"Constance" red and "Leanne" buff to apricot. Soft mid green foliage. "Pink Pearl" 6'-8' long, pointed branches carrying bright red flowers over the whole length. Fine and pointed dark green foliage.

Grevillea hybrid thought to be a hybrid of *Grevilleas asplenifolia* and *caleyi*, 6'-8', vigorous, excellent foliage, and large red toothbrush flowers.

Grev. tridentifera 6'-8', masses of white flower, long narrow light green triple foliage. The variety *erinacea* 5'-6', masses of cream flower, highly perfumed, light green triple foliage. A *G. tridentifera* form 4'-5', masses of lime green flowers and light green coarse triple foliage. A *G. tridentifera* form, 6'-8', masses of cream and white flowers and light green coarse triple foliage. All the *tridentifera* forms of *Grevilleas* are very vigorous, hardy, and very bright in flower.

Grev. triloba, 6'-8', masses of cream and white flowers and thick triple foliage.

Grev. glabrata, 6'-8', a vigorous shrub with long lacey sprays of white flower and light green holly like foliage. A *G. glabrata* form 6'-8', a vigorous shrub with long lacey sprays of white flower and darker green holly like foliage.

LOW GREVILLEAS WINTER FLOWERING—

Grev. chrysophaea 3'-4', large golden flowers and mid green foliage. The Anakie, Victorian form, being of very good colour.

Grev. sericea 3'-4', large cerise flower heads and dark green pointed foliage.

Grev. baueri 2'-3', bright red flowers and bronze green foliage.

Grev. pinaster, 4'-6' in width, a wide spreading shrub with grey green long narrow foliage and lacey sprays of bright red flower.

Grev. rosmarinifolia form 2', cascading and semi prostrate, bright red flowers and thin needle steel grey foliage. Excellent on walls or rockeries.

Grev. buxifolia 2'-3', grey to red flower heads and soft green foliage.

Grev. oleoides 3'-4', bright red flowers, long and narrow deep green foliage.

Grev. dallachiana 3'-4', red and ivory flowers and ashen grey foliage.

Grev. pritzelii 3'-4', black tooth brush flowers and long narrow pointed ashen grey foliage.

Grev. fasciculata 2'-3', bright red and orange flowers and dark green soft foliage.

Grev. punicea 3'-4', dark red large spidery flowers and dark green pointed foliage.

Grev. patentiloba 3'-4', large sprays of soft ivory pink flowers which are similar to those of *Grev. bippinatifida*, short stalky grey foliage.

Grev. victorice 3'-4', dark red flowers and long broad dark green foliage.

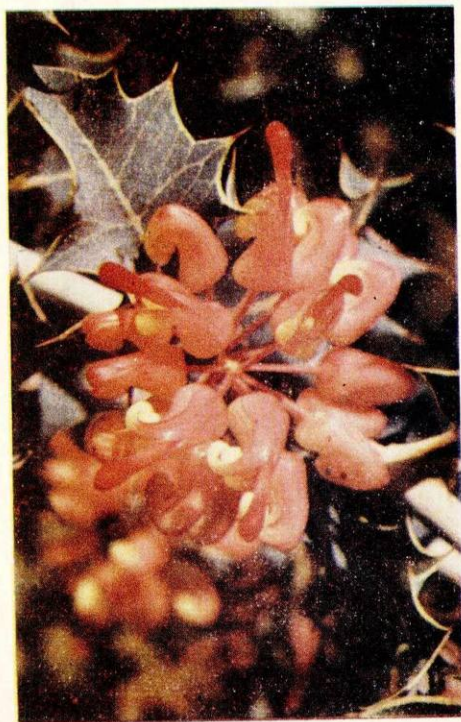
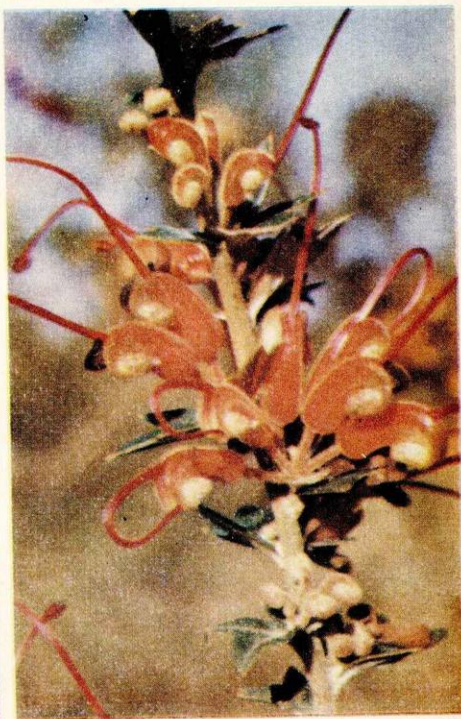
Grev. alpina 4'-5', orange and red flowers, soft mid green foliage. There are many forms of *Grev. alpina* ranging in height from semi-prostrate to wide shrubs 6' in height.

Grev. lavandulacea, prostrate to 4'. The many forms of this *Grevillea* make it a very interesting variety of the species. The flowers range from large pink, light mauve to dark red. The foliage is normally fine and steely grey green.

And *Grevillea* hybrids, "Coral" 2'-3', a dense and rounded shrub with light green foliage, and masses of red and ivory flowers. A hybrid thought to be *G. lavandulacea* and *G. rosmarinifolia* cross, 3', bright red flowers and short steel green foliage, arching branches. "Olympic Flame" 3'-4', bright red and ivory flowers and short mid green foliage.

Photography by Joe Glass.

Photography by P. Althofer.



Grevillea trachytheca
Grevillea insignis

Grevillea juncifolia
Grevillea macrostylis

GREVILLEAS AS GROUND COVER PLANTS—

Many of the Grevilleas are excellent for the purpose of ground cover, some of the best are as follows:—

Grev. laurifolia may cover an area 10' x 10' and if unimpeded will remain absolutely flat. The flowers are dark red of the toothbrush form, glossy foliage large and broad, ranging from copper to dark green.

Grev. trinervis, deep red round shaped flower heads and small dark green foliage.

PROPAGATING WARATAHS

by Les Scott

Waratahs are one of the easiest natives to propagate. Here are some suggestions. Put 2-3 inches of sand in a seed box, scatter your seed on the surface of a medium grey bush sand, then lay an old towel on top, and keep it wet. After a couple of weeks, lift the towel and check the seed. Remove seed that has developed a root at least $\frac{1}{4}$ inch long, or more, and place it in a small 2-3" pot. Again place a wet towel on the germinating seed, until the seed casing comes away.

When the plant starts to make a little growth, transfer to a 6 inch pot and do not water any more. Seed and young plants must be put in an open sunny position at all times.

Editor's Note: Waratah and *Grevillea* are from the same plant family and generally require similar treatment. With some species, however, it has been found expedient to peel the seed—See Vol. 2, No. 15 issue.

DISEASES IN BANKSIAS AND OTHER PROTEACEAE by F. Lullfitz

I have observed with some dismay the heavy mortality in Banksias particularly and to a lesser degree in the other Proteaceae. Possibly the apparently heavier losses in Banksias may be due to the fact that they are being cultivated to a greater degree than *Hakea*, *Grevillea*, etc.

The spectacle of a healthy Banksia dying suddenly — within two or three days — in summer is a matter which needs some investigation and research. I feel this subject should be thoroughly thrashed out and full reports invited on every case that can be observed so that the mass of data may provide some solution.

Most of the dead plants show a complete decomposition of the root bark just a few inches below ground level. This is not confined to the Banksias alone. Sturts Pea and Ashburton Pea are also healthy, vigorous plants one day and then, in the midst of healthy growth they wither and display the symptoms of sudden drought. This is no doubt due to the destruction of water bearing tissue just below ground level.

Is the cause a fungus? I have heard mention of *Phytophthora* being the causal organism. If so is it confined to particular species? Will it spread in the garden to other plants indiscriminately? Can we use some remedial treatment? Would liberal applications of fungicide clean it up?

One of the obvious causes of the disease is summer watering which no doubt gives the soil a condition ideally suited to fungal growth when the stricken plant is in a state of normal summer dormancy.

It is indeed a fact that some Banksias die in the bush occasionally. This happens mostly in the vicinity of newly cleared and settled areas. Very rarely in the "bush" proper and then perhaps the cause can be traced to white ants or a particularly dry summer reducing the water content of the soil below survival requirements.

Banksia coccinea and *brownii* seem to have the least resistance and a 4-year-old *Banksia brownii* twelve feet high dying in February is something to weep about.

Could we interest a study group in the S.G.A.P. to follow this up?

FROM DR. L. R. FRASER, DEPT. OF AGRICULTURE, N.S.W.—

Your Banksia problem may have several components. Death of Proteaceous seedlings in the early stages is not uncommon. Waratahs in particular are subject to attack by a species of *Pythium* which causes them to damp off. A potting medium with a high peat content might help to obviate this if you do not wish to use sterilized soil. Also the maintenance of strict hygiene, destruction of diseased material, sterilizing contaminated pots, boxes, benches etc. is important.

The death of established Banksias referred to by your W.A. correspondent sounds like *Phytophthora* attack. We occasionally get Banksias and other native plants dying in undisturbed bush due to attack by *Phytophthora cinnamomi* under wet conditions. Good drainage is the only solution to this problem.

If the W.A. plants are growing in well drained soil our experience here would suggest that *Phytophthora* would not be involved.

GREVILLEA ON HEAVY SOIL

From J. Howard, Nurrawading, Victoria (Heavy clayey loam with fairly good drainage owing to the slight slope of the ground). Grevillea of all kinds grow well. In the driest, very unfavourable spot of the north-west fringe of a big pine tree, *Grevillea tridentifera*, *G. tripartita*, and *G. crithmifolia*, all from W.A., have all done very well in contrast to quite a few others, e.g. tea trees, which died. *G. burifolia* proved hard to establish several times in a better position, even though soil was lightened. *G. banksii* is thriving in a warm spot with plenty of humus on top.

WARATAHS IN HEAVY SOIL

(by H. Brackpool)

The common belief that Waratahs only grow in sandy soil is a fallacy.

Otherwise the healthy plants that I have had growing in the heavy Eastwood soil for twenty years, would have been dead long ago. One variety of these two originals seems established at about six feet, whilst the other is around nine and still trying to go higher. Many gardeners, like scientists, are always learning and in the process many experiments are conducted, therefore, since my article on waratahs in the September 1961 issue of "*Australian Plants*", I have a few further comments to make.

Some years ago I began trying to make a grove of about 20 waratahs and what has happened there has increased my knowledge. In long periods of excessive rain, plants died off, one after the other, three even after reaching 5 to 7 feet, whilst smaller 2 year old plants, even though mulched, summer shaded, and not hand watered at all still died.

Yet about 7 in the grove survived to reach several feet in height, remain robust, and bloom. Why?

Well, it appeared that the ones that lived and remained healthy were those that were growing in ground that was slightly higher than that a foot away from the trunks. It was then, after losing several plantings from excessive rainy periods, or as the result of these that I remembered the words of a friend of mine whose family had been nurserymen for years. He told me that at the base of every waratah plant is the early crown from which the new canes eventually sprout; (you know how this develops into something like half a coconut shell, convex side up, as the plant grows bigger); and if this crown gets too much moisture it rots and the plant dies; especially a young plant.

My next plants, when I have raised them from my own seeds and they are two years old, will be used to fill in the gaps in the grove, but, this time they will each be planted in small mounds of about 12 inches in diameter and 4 to 5 inches high at the centres to slope down to the level of the rest of the soil. These mounds actually will be shaped like inverted washing-up basins. The surplus water then should drain away properly from the young crowns and success should be assured.

When transplanting my two-year-old plants from their pots they will of course be watered in, but after that, unless there is a long very dry spell, the mulching and the overhead shade in the hot weather, until the plants reach a couple of feet in height, will conserve enough moisture.

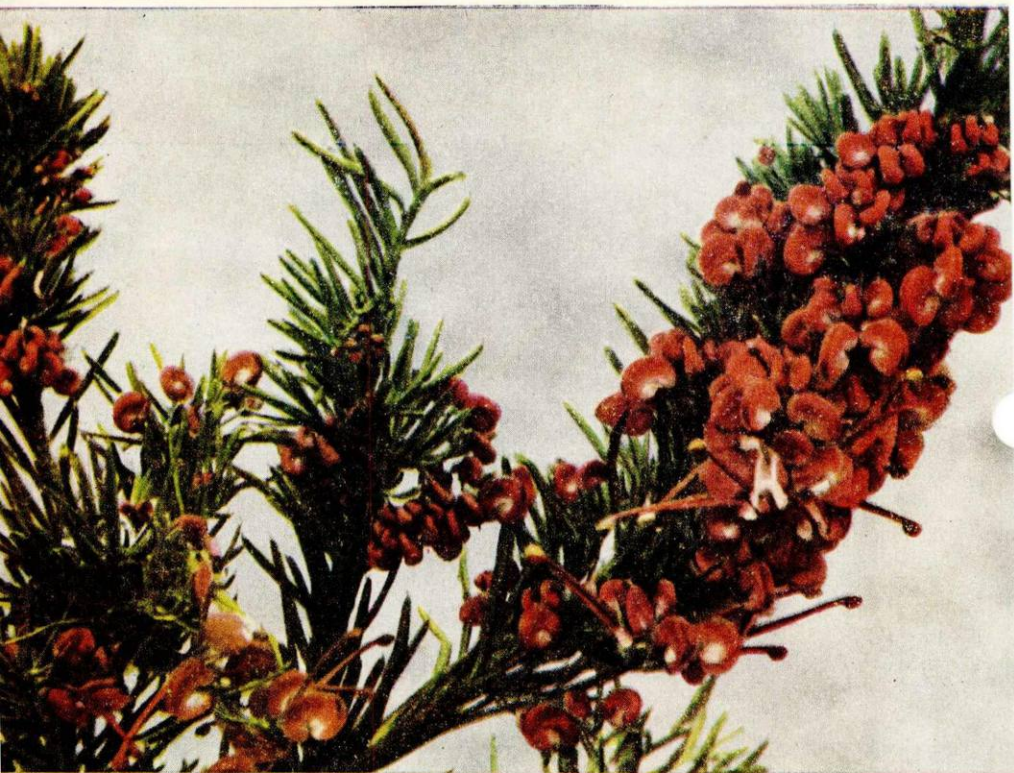
With waratahs, at least, my experience shows that too much water kills, rather than too little, particularly in heavy soils.

I will never forget in 1949, at Araluen, Western Australia, on a half day tour from Perth, what a pleasure it was to see some waratahs flowering magnificently on the drier side of our continent and looking quite at home.

GREVILLEA LIKE WARATAH ARE PROTEACEAE

Editor's Note: Many consider Waratah prefer a light sandy soil. While they grow in a light soil if well watered and fed with blood and bone, they prosper in a good deep soil with drainage. The above article will give heart to those in heavy soil areas, people who should realise their advantage over others less fortunate. The main problem is drainage to avoid the disease problem mentioned on page 14.

Elsewhere reference is made to some *Grevillea* that are difficult. Treat them as Waratah as above. The footnote pp. 14 will also apply to the fortunate with heavy soil. We shall be having a special issue on the growing of natives in heavy soil and readers experiences would be appreciated.



(Above): Reprinted from *Shrubs and Trees for Australian Gardens*, by Ernest E. Lord by courtesy of Lothian Publishing Co. Pty. Ltd.

A spike of ROSEMARY GREVILLEA, *Grevillea rosmarinifolia*

(Below): Reprinted from *Victoria's Resources* by courtesy of the Natural Resources Conservation League of Victoria.

OLIVE GREVILLEA — *Grevillea oleoides*



GREVILLEA IN ADELAIDE

by I. G. HOLLIDAY

Grevilleas, those very desirable shrubs from the family proteaceae, are not generally grown successfully in Adelaide. The main reason for this is their dislike for calcareous soils.

Of those in cultivation, *Grevillea rosmarinifolia* (rosemary grevillea) is the only one readily available from all nurserymen, and even this well-known species is not completely successful on the very alkaline soils of parts of the Adelaide plains. In general, it should be assumed that grevilleas are only suited for the Hills districts, the river and creek valley soils (usually good well-drained loam or sand) which occur in a few isolated areas, and the outer foothills areas where, due to elevation, leaching of the soil effectively decreases the alkaline soil effects.

Some of the more desirable Grevilleas, which demand an acid to neutral well drained soil, can be successfully grown by the enthusiast by preparing raised beds 12ins. or more above normal ground level and filling with friable loam or sand bolstered with leaf mould or peat moss, or even just an acid sand.

Of the Grevilleas grown here, the following have proved the most reliable, and can be grown on the soils previously mentioned without any special treatment.

GREVILLEA ALPINA (Mountain Grevillea)

A dwarf shrub occurring in two forms, one stiff and upright, the other prostrate with cascading foliage. Lovely red and yellow flowers in profusion in early spring.

GREVILLEA AQUAFOLIA and its near relation.

GREVILLEA ILLICIFOLIA, the two holly leaved grevilleas.

Both are spreading shrubs 3ft. or 4ft. high with dense prickly, but handsome holly-like foliage, bronze new growing tips, and red toothbrush flowers in early spring.

GREVILLEA ASPLENIFOLIA (fern leaf grevillea)

A dense, large spreading shrub to 8ft. high with attractive serrated ferny foliage and red toothbrush flowers.

GREVILLEA BIPINNATIFIDA (Bipinnate Grevillea)

A prostrate bush with prickly ferny leaves and dull brick-red large spider flowers which blooms for 12 months continuously. Very effective in a raised bed or rock garden.

GREVILLEA CHRYSOPHAEA (Golden Grevillea)

A loosely branched shrub to 4ft. high with small golden flowers, which, although not showy, have the attraction of blooming for 12 months of the year.

GREVILLEA LANIGERA (Woolly Grevillea)

Closely resembles grevillea rosmarinifolia, but has more prominent cream and red flowers. Dense fine dark green foliage with good ground cover.

GREVILLEA LEUCOPTERIS (White Plume Grevillea)

This spectacular dry area grevillea can be successfully grown on the calcareous soils if drainage is good. A tall shrub with large ferny leaves

(Continued on page 27)

GROWING ORCHIDS FROM SEED

by G. C. SIMMONS

INTRODUCTION:

Most books describing the cultivation of orchids include details on growing them from seed under sterile conditions on an agar gel medium. The "Australian Orchid Review", Vol 17, pages 99 and 119 (1952) describes the subject, as does the article in "Australian Plants", Vol. 1, page 9 (1961).

It is not difficult to obtain satisfactory germination if suitable seed is used, and the nutritional requirements of the particular orchid are known. Fortunately most orchids do not have strict nutritional requirements. In the author's opinion, however, the critical stage in growing orchids from seed, is the transferring of the seedlings from the sterile bottle to the non-sterile environment in pots. This is especially so if a heated glasshouse is not available.

MATERIALS REQUIRED:

Containers — Square half pint cream bottles (Fig. nos. 1 and 8); rubber cork, through the centre of which is a piece of glass tubing plugged with cotton wool, is used to seal the bottle. This is shown clearly in Fig. 2.

I prefer Difco. BBL seems to give a rather sloppy agar gel and while the seeds grow in a satisfactory manner, one has to be careful when handling the bottles otherwise the agar will break and the seed or seedlings are immersed in the medium instead of lying on top of it.

Sterilizer — The recommended apparatus for a person without access to a bacteriological autoclave, is a Namco Pressure Cooker-Canner Model 15 (Fig. 1, No. 1) for the reason that it has a pressure gauge. It is a 16 pint pressure cooker and will take seven cream bottles.

Medium — Dehydrated media are available from laboratory equipment suppliers. Both Difco and BBL brands have been used with success.

Distilled or fresh rain water is required to dissolve the medium. The agar in the medium does not supply nutrients but is used to hold the mineral salt-sugar nutrients and form a gel on which the seed can grow. Agar has the peculiar quality of melting at about 95°C., but solidifying at about 44°C.

Scales — These are required to weigh out the dried medium. Many kitchen scales of dietary type have sufficient accuracy if access to a laboratory or chemist's balance is not possible.

Calcium hypochlorite (bleaching powder) — This is required for seed sterilization. Only material smelling strongly of chlorine should be used.

Other equipment required is a spirit lamp or gas Bunsen Burner, Platinum or nichrome loop, measuring cylinder, and beaker (500 ml. is a convenient size).

METHOD:

Preparation of Containers:

The containers recommended require about 30 ml. of medium each. The total amount of the dried medium is weighed out and put into the beaker and the water added. For example if 10 bottles were being prepared, 10 x 30 (equals 300) ml. medium would be required. If using BBL orchid agar, the makers recommendations are to dissolve 34 g in 1 litre (1,000 ml), hence for 300 ml, it would be necessary to weigh out 10.2 g of the dried medium to add to 30 ml. of water. After dissolving the medium as recommended by the manufacturer, the medium is dispensed (Fig. 3) into the bottles, taking

Fig. 1

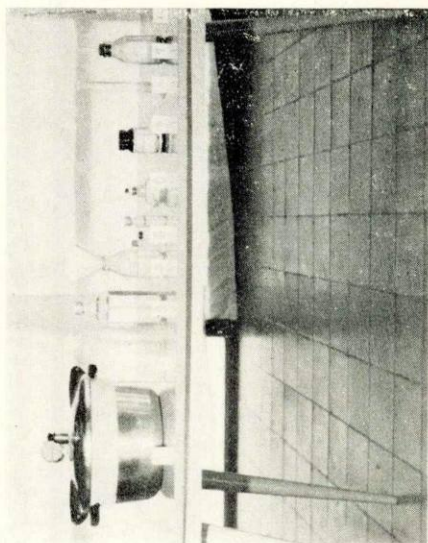


Fig. 3

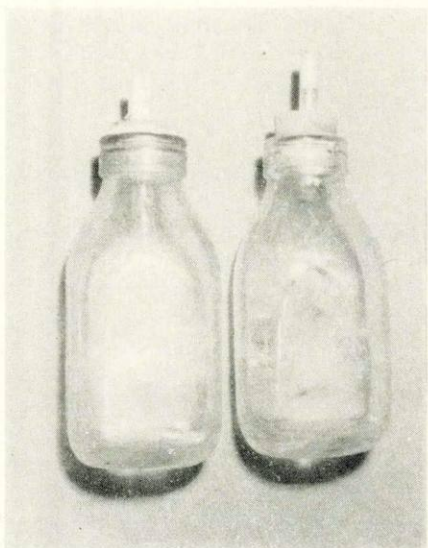


Fig. 2

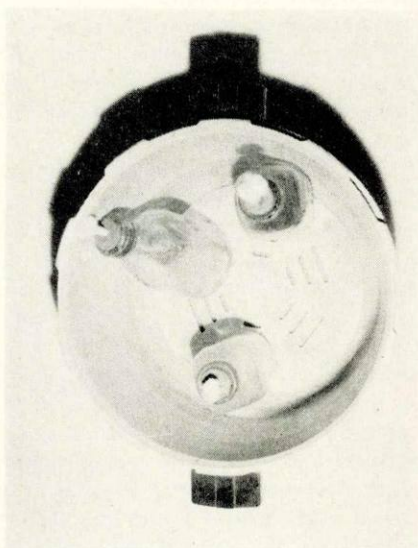


Fig. 4

FIG. 1: Materials—1. Pressure Cooker; 2. Beaker; 3. Distilled Water; 4. Funnel with filter paper in container (to filter Calcium hypochlorite solution); 5. Seed containers and bottle to hold sterilizing solution; 6. Methylated spirits burner; 7. Dehydrated medium; 8. Measuring cylinder; 9. Containers for medium; 10. Platinum loop.

FIG. 2: Two containers of medium one uninoculated, alfoil cover on tube, and the other with the small plants showing as shadows through the glass, the alfoil cover and cotton wool plug pushed down the tube.

FIG. 3: Pouring the medium into the container. Cork of container is being held between little finger and palm of hand holding the cylinder.

FIG. 4: Pressure Cooker with three containers.

care to avoid spilling it around the neck of the bottle where it will be a fertile field for fungi. The stoppers are inserted.

The bottles are stood in the pressure cooker (Fig. 4), the lid put on, and pressure is raised. The medium is sterilized at 15lb. for 15 minutes. The containers are removed from the pressure cooker as soon as the pressure has dropped so that the lid can be removed. The bottles are placed on their sides, to allow the agar to form a layer. If the agar does not form a firm gel it is possible that the gauge is inaccurate and the excessive temperature has caused the agar to break down. The remedy is to try the next batch at 12lb. per square inch during the 15 minutes sterilizing period. The same breakdown may occur if the medium is kept hot for a long period. The prepared containers of medium may be left for several days at room temperature to determine whether sterilization has been effective. If it has not, colonies of fungi or bacteria will grow on the surface and are readily apparent on close inspection.

PREPARATION OF SEED STERILIZING SOLUTION

Ten grams of calcium hypochlorite are mixed with 140 ml of water and allowed to stand 30 minutes with occasional shaking. The fluid is filtered or decanted off after the insoluble material has settled out. A drop of detergent or wetting agent such as "Agral" (I.C.I.) may be added to assist wetting the seeds.

STERILIZING THE SEEDS

A small quantity of seed is put into a bottle, the bottle is half filled with the sterilising solution, tightly capped and then left for 30 minutes with frequent vigorous shaking. It will be noticed that seeds will sink, remain dispersed or float depending on the batch of the seed.

SOWING THE SEED

If seed in the sterilizing solution sinks, pour off most of the solution. Sterilize the platinum loop in the gas or spirit flame, allow to cool in the fluid and then pick up some of the seed on the loop. After removing the cotton wool plug, place the seed onto the surface of the medium (Fig. 5). There is usually a small quantity of water of condensation in the bottle and the seeds can be manipulated into this to disperse them. Replace the plug. The end of the cotton wool plug should not be allowed to touch anything while it is out of the container. This can be accomplished easily by holding it between the third finger and the little finger of the hand that holds the loop. The protruding end of the plug is burnt off and it is then pushed down the glass tubing slightly (Fig. 2, bottle 2). If desired a piece of aluminium foil may be pressed around the glass tube as in bottle 1, Fig. 2. The medium is then inspected and if the seed is not evenly distributed or is adhered to the side of the bottle, the condensed fluid is tipped gently to wash the seed into the desired position. It is highly desirable that the process of seed sowing be done as quickly as possible to minimise the chances of fungal spores getting into the bottle. If undue delay occurs, pass the glass tubing through the flame several times to kill any fungi or bacteria that may have settled into the entrance of the tube before replacing the cotton plug.

INCUBATION OF CONTAINERS

After sowing the seed the containers are placed in a warm, dry area where reasonable light reaches the seed. Once germination is evident

Fig. 5

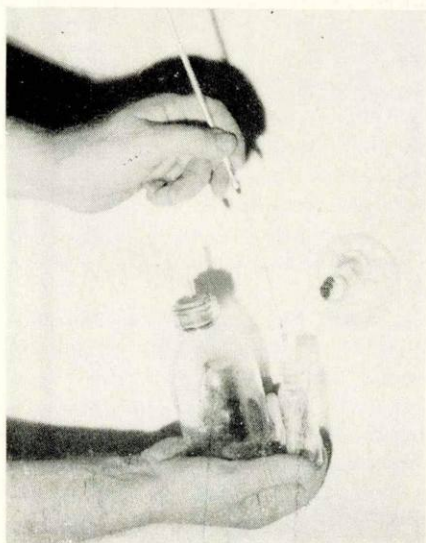


Fig. 6

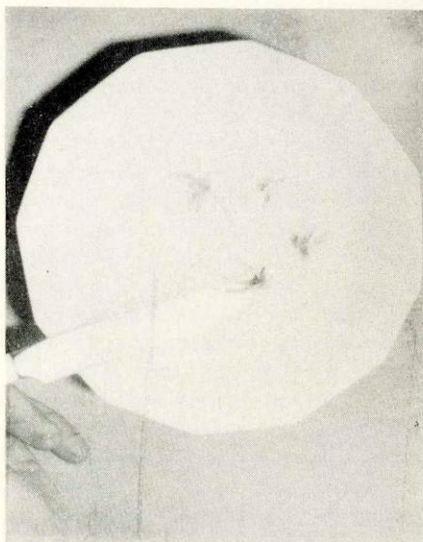


Fig. 7



Fig. 8

FIG. 5: Transplanting seed from sterilizing solution to container. Note cap of bottle held between palm and little finger and cotton wool plug between third and little finger. Bottles and container are held on side to minimise the risk of fungal spores dropping into them. The procedure is done near the burner.

FIG. 6: Dish with orchid seedlings floating in water.

FIG. 7: Containers contaminated with fungi (black areas).

FIG. 8: Established *Dendrobium* seedling. Seed sown 24-3-57 and transferred to the pot on 4-2-60.

the light intensity may be increased. Inadequate light intensity will be readily apparent by the growth of plants towards the light source.

When it is desired to remove the seedlings, the medium with seedlings is shaken out into a dish of water (Fig. 6) and the small plants placed in

community pots. Fig. 8 shows a *Dendrobium* seedling in a three inch pot. The seed was sown on 24th March, 1957.

TYPES OF AND REASONS FOR FAILURE

1. *Fungi (moulds) appearing within a few days of sowing seed*

The dark areas in the bottles in Fig. 7 are colonies of fungi. This may be caused by seeds so badly infected that sterilization is not effective. Unless so valuable that a second attempt is worthwhile, infected seed should be destroyed. Alternatively contamination has occurred during sowing. The remedy is to take more care, bearing in mind always that the task is to prevent fungi in the air entering the bottle when the plug is removed.

2. *Fungi appearing several months after sowing*

This may be due to germination of spores lying dormant in the flask after having entered when sowing. It is more likely to be caused by fungi getting into the container through an inadequate cotton wool plug, perhaps as the result of saturation with water on one occasion. In this regard the possibility that fungi will grow down through the cotton wool plug will be greatly increased if the containers are kept where they are drenched with water or small insects can gain access. To act as an additional barrier to contamination, the cotton wool may be saturated with mercuric chloride (note this is poisonous and care should be taken when using it) or copper naphthenate. Providing the aluminium foil is not so tight as to restrict entry of air, the author considers, this method does not require chemicals as an additional safeguard.

3. *Seeds swell and possibly turn green, but fail to develop*

This is caused by inadequate nutrients in the medium. Some orchids require more than the mineral salts-sugar mixture to germinate and grow. For example, one of the vitamin B group stimulates growth of some orchids, hence extracts of yeasts may have to be added. Common extracts used are coconut juice, tomato extract and digests of fish meal.

4. *No germination*

Seeds are sterile. This can usually be recognised before sowing as under the microscope the fertile seeds have a plump embryonic germ whereas infertile seed are collapsed and without this yellowish lump. It is suggested that contents of the containers be discarded if no growth appears within 2-3 months after sowing.

GENERAL COMMENTS

Generally seedlings will be ready to take out of containers about eight months after sowing but the rate of growth may be markedly influenced by the temperature of incubation, nutritive quality of the medium and the species of orchid.

The dried medium recommended is based on Knudsen's formula. This is one of the earliest suggested and many orchid growers will be quick to point out the great advantages of many fruit and plant extracts to stimulate growth.

On the other hand the dried media has two great assets. These are ease of preparation and uniformity of the product. The last point is very important if one does want to experiment with additives such as colchicine or coconut juice because containers of untreated medium can be used as controls to compare with growth of the seedlings on the modified medium.

INDEX TO VOLUMES No. 1 & No. 2

AUSTRALIAN PLANTS—Index Volumes 1 & 2

An index is provided to assist readers to find subjects of their choosing. A study of the indexes of other books impressed me with the diligence of the compilers but their use is often a time consuming occupation. They usually attempt to index every name and item. As it is our desire to eventually mention all Australian wildflowers an attempt at an index along orthodox lines would result in an enormous list tending to become a complete census of Australian Plants. This index is, I hope, styled in a more practical way to the requirements of this publication and its readers.

For definition of words or terms, please refer to our extensive glossary of botanical terms, "The Language of Botany"—Editor.

ABUTILON—*A. leucopetalum*, 19:215.

ACACIA—Commonly called wattle (not extensively treated yet but the species commonly used in gardens have all been mentioned.)

"Some Dwarf Acacias" by I. C. Holliday—6:1—*A. myrtifolia*, *A. rotundifolia*, *A. colletioides*, *A. continua*, *A. acinacea*, *A. pulchella*, *A. drummondii*, *A. burifolia*.

"Wattle Trees" by A. E. Brooks, 6:4—*A. baileyana*, *A. cyanophylla*, *A. decurrens*, *A. drummondii*, *A. elata*, *A. howittii*, *A. longifolia*, *A. pydalrifolia*, *A. pycnantha*, *A. rhetinosodes*, *A. spectabilis*.

"Acacia Growing in Poor Soils and Under Wet Conditions" by A. C. Keane, 9:11.

"Acacia botrycephala syn. *A. discolor*" by R. D. Croll, 11:21.

Acacia from Central Australia, 18:202—*A. aneura*, *A. estrophiolata*, *A. kempiana*, *A. murrayana*, *A. strongylophylla*, *A. victoriae*.

Acacia Study Section, 9:11. A group of readers interested in Wattles.

"Wattle Trees—Which One Is That", an investigation by R. D. Croll, 9:12.

ADENOSTEMMA—*A. viscosum*, 19:231.

AGONIS—A passing reference, 10:3.

ANGIANTHUS—*A. acrophyllinus*, 19:211.

ANGOPHORA—The Genus by C. N. Debenham, 7:19 (All species described).

ANIGOSANTHOS—The Kangaroo Paws, all species described in:

"The Kangaroo Paws of W.A." by B. J. Grieve & N. Marchant, 16:107.

"Growing the Kangaroo Paws" by J. S. Beard, 16:106.

Diseases are discussed in "Ink Disease", 16:115 and "Black Disease", 16:116.

AUSTRALIA—Climatic zones for classification of native plants habitat, 10:16, 11:19.

ATRIPLEX—*A. nummularia*, 19:215.

BANKSIA—Only a few species have been mentioned so far:

Banksia spharocarpa, 7:14—*B. collina*, 12:30—*B. ericifolia*, 12:32—"My Banksias", 13:11—"Banksia From Seed", 12:31.

BAUERA—The Genus by A. M. Blombery, 17:149—All species described.

BEAUFORTIA—A passing reference, 20:270.

REILIDA—*B. major*, *B. graminea*, 19:211.

BLANDFORDIA—The Genus, 13:3. All species described in:

"Cultivation of Christmas Bells" by P. J. Parry, 13:3—Christmas Bells from Seed, 13:4.

BOOKS—Books are reviewed in each issue and the Editor has taken the liberty of listing them in the following order, based on his personal opinion.

Reference books for general home gardening with excellent coverage of natives.

"The Practical Home Gardener" by T. R. N. Lothian, 5:6. Especially for dry areas.

"Shrubs and Trees for Australian Gardens" by E. E. Lord, 9:18, 20:282.

"Seaside Plants of the World" by E. A. Menninger, 20:258—An American publication.

"Flowering Trees of the World for Tropics and Warm Climates" by E. A. Menninger, 11:22.

Reference books dealing wholly with the garden cultivation of wildflowers.

"Australian Plants for the Garden" by Thistle Y. Harris, 13:16.

"Growing Australian Plants" by Noel Lothian and Ivan Holliday, 21:36.

"Australian Native Plants for Home Gardens" by A. E. Brooks, 6:8, 10:20.

Reference books describing wildflowers and trees:

"The Eucalypts" by J. L. Willis, 8:13.

"Blue Mountain Gums" by Colin Burgess, 18:196. A small booklet.

"Some Trees of Australia" by H. Oakman, 14:90. Mainly Queensland trees.

"Wildflowers of Victoria" by Jean Galbraith, 6:8. For the Victorian bushlover.

"Wildflowers of Western Australia" by C. A. Gardner, 3:12. Beautifully illustrated.

"Wildflowers of Australia" by Thistle Y. Harris, 12:12.

Books on Wildflowers, a little technical, but styled for the interested layman.

"How to Know Western Australian Wildflowers", Vol. 1 and 2 by W. E. Blackall and B. S. Grieve, 8:23.

"Trigger Plants", by Rica Erickson, 9:18. A delightfully written book.

"Toxic Plants of Western Australia", by C. A. Gardner and H. W. Bonnets, 10:20.

"The Wattles of the Australian Capital Territory", by N. T. Burbridge, 11:22. A booklet.

"A Handbook to the Plants of Victoria" by J. H. Willis, 13:16. Excellent.

"Handbook of the Vascular Plants of the Sydney District and Blue Mountains" by N. S. W. Beadle, O. D. Evans and R. C. Carolin, 17:162. The only complete guide to wildflowers in this area.

"Dictionary of Australian Plant Genera" by N. T. Burbridge, 14:90.

Coloured booklets on wildflowers:

"Australian Native Plants and Trees", published by Patterson Brokensha Pty. Ltd., 11:22.

"Eastern Australia Wildflowers" by Thistle Y. Harris, 12:12.

Books specialising in orchids:

"Australian Orchid Review", 12:12—Published by the Orchid Societies.

"Orchids of the West" by Rica Erickson, 5:6—Terrestrial orchids of W.A.

"Orchids of Australia" by W. H. Nichols, 17:162.

A book for the lover of fauna as well as flora:

"Along the Track" by Crosbie Morrison, 9:18. Well written and very interesting.

BORONIA—"The Cultivation of Boronia" by W. N. B. Quick, 17:139. This adequately covers most aspects of their cultivation being supplemented by "Boronia from Cutting" by J. M. Corkery, 17:145—"How I grow Native Rose" by J. Twyford, 17:163, and "Growing Boronia", 14:67.

"The Bell Flowered Boronia" by W. N. B. Quick, 17:14.

Boronia, mostly from the Sydney District, are covered generally by "Boronia Suitable for the Garden" by Don Sands, 18:207—*Boronia pinnata*, 10:21—"Sydney Boronia", 17:138.

BOTANY SERIES by H. Lee, nee H. Purnell. A series of articles to present the essential features of botany to the amateur gardener.

"The Inflorescence" (The first in the series was by R. C. Carolin), 1:11.

"The Flower", part 1, 2:7 — part 2, 3:9 — part 3, 4:15 — part 4, 5:15.

Pollination, 6:7 — Fertilization, 7:15 — Fruits, 9:27.

The Seed, 11:13 — Germination, 13:7, 44 — Dormancy, 15:91.

BOTTLEBRUSHES — The introduction, 20:250 and 20:267 (Will refer the reader further).

BRACHYCHITON — "The Genus" by C. N. Debenham, 9:3 (All species described).

"Brachychitons" by E. E. Lord, 9:2, under the headings of Flame, Kurrajong, Bottle, Lacebark, Hat and Dessert Kurrajongs, will cover all gardeners queries.

"Brachychiton In S.A." by R. G. Gray.

BRACHYCOME — *B. ciliaris*, 19:213, *B. latisquamea*, 19:241, *B. iberidifolia*, *B. multifida*, 19:228.

BRASSIA — *B. actinophylla* by H. Oakman—The Umbrella Tree.

BUCKINGHAMIA — *B. cecissima* by H. Oakman, 19:245 and R. J. Peach, 19:244.

CALANDRINIA — *C. balonensis*, *C. remota*, 19:217.

CALLISTEMON — "How to Know Bottle Brushes" by E. E. Lord, 20:251 (Mentions most species).

"How to Grow Bottle Brush" by J. L. Abel, 3:1. "Growing Bottle Brushes" by I. C. Holliday.

Callistemon viminalis is featured as a street tree, 13:21.

"Two New Bottle Brushes" by H. W. Caulfield, 3:4, 20:254, introduces *C. montanus* and *C. formosus*.

How they are classified botanically is mentioned on 20:250 and 20:267.

CALOCEPHALUS — *C. platycephalus*, 19:213, 19:214 — *C. brownii*, 19:228.

CALOTHAMNUS — A passing reference, 20:270.

CASSIA — A reference to dry area species from Central Australia, 19:214.

CELMISIA — *C. longifolia*, *C. sericophylla*, *C. saxifraga*, 19:228.

"CENTRAL AUSTRALIAN PLANTS FOR THE GARDEN" by R. F. G. Swinbourne. Wildflowers from the area for planting in Alice Springs. Part 1, 18:170 — Part 2, 19:212.

CENTAUREA — *C. australis*, 19:230.

CEPHALOTUS — "The Genus" by B. J. Grieve, 8:26 — Describes the W.A. Pitcher plant.

CENTIPEDA — The species, 19:230.

CERATOPETALUM — "The Genus," by J. L. Willis, 5:4. Describes all species.

Ceratopetalum gummiferum, the N.S.W. Christmas Bush is mentioned in "How to Grow N.S.W. Christmas Bush" by P. J. Parry, 5:2 and "Grow From Seed", 5:3.

CHIOLOTTIS — "The Genus" by L. Cady, 8:5. Describes all species.

CHRISTMAS BELLS — See *Blandfordia*—Christmas Bush, see *Ceratopetalum* above.

CHRISTMAS TREE OF W.A.—see *Nuytsia*.

CHTHONOCEPHALUS — The species, 19:229.

CIENTUGOSIA — *C. gossypoides*, 19:214, Sturt's Desert Rose.

CLIANTHUS — *C. formosus*, "The Sturt Desert Pea" by F. Bridgeman, 12:3. All aspects of seed germination, variations in plants, nutrition, climate, soil, etc.

COMPOSITAE — "The Family" by J. H. Willis, 19:223. All genera of the family listed.

CONOTHAMNUS — A passing reference, 10:3, 20:250.

CORREA — "The Genus" by Paul Wilson, 11:3. All species are described.

"How to Grow Correa" by A. E. Brooks, 11:1 — "Grow Correa in Pots," by R. Hardie, 11:5.

COTULA — The species, 19:230.

CRASPEDIA — The species, 19:229.

CROTALARIA — *C. cunninghamii*, 19:214.

CROWEA — "The Genus" by Jean Galbraith, 4:2. All four species are described.

"How to Grow Crowea" and "Propagation" by W. Cane, describes cultivation.

CUPANIOPSIS — *C. anacardioides* by H. Oakman, 18:183. A street tree.

CUTTINGS — see propagation.

CYMBONOTUS — *C. lausentianus*, *C. preissianus*, 19:231.

DAISY FAMILY OF WILDFLOWERS — See Compositae and Olearia.

DASYPOGON — *D. bromatiifolia* by Gray and Strutt, 7:12.

DENDROBIUM — "Dendrobium in Brisbane" by W. M. Bristow, 9:13.

D. bigibum, The Cooktown Orchid, 15:75, 15:77, 17:151, 19:248, 19:239.

D. decipium by A. W. Dockrill, 19:239 and closely related to *D. superbeins*, 17:152.

D. falcostrosum — "Australian Orchids" by R. F. Leaney, 2:15 — "The Mystery Of" by H. J. Bear, 2:14.

D. kingianum by R. F. Leaney, 4:18 — *D. rigidum* by R. F. Leaney, 13:31.

D. speciosum by R. F. Leaney, 11:32.

DIPLODIUM — "In Australia" by L. Cady, 14:40. All Australian species.

DIURIS — "The Commoner Diuris in Australia" by L. Cady, 19:172 — *D. aurea*, 19:176.

DRYANDRA — "The Genus" by R. D. Royce, 7:5, 8:22, 8:19. A key to all species, 8:22.

Articles on cultivation of various species are "Dryandra for the Garden" by Alf Gray, 7:1 — "Dryandra in East Australian Gardens" by R. Doney, 7:3 — *D. formosa* and *D. mucronulata* by E. Ashby, 7:6 — *D. sessilis* by Gray and Strutt, 7:12 — *D. speciosa* by R. D. Royce, 8:21 — "Dryandra in S.A." by R. J. Stewart, 8:20 — "Dryandra in Qld." by B. Hockings, 8:20 — "Dryandra from Seed" by A. Gray, 8:20.

EMU BUSHES — See *Eremophila*.

ENCHYLAENA — *E. tomentosa*, 19:215.

EPACRIS — *E. impressa* by W. N. B. Quick, 15:103 — Principally propagation.

EPIBLEMA — "The Genus" by Rica Erickson, 5:23. The only species.

EREMOPHILA — Emu Bushes — "Shrubs For Dry Conditions" by R. Hill, 10:5 — "Eremophila for Qld.", 19:220 — "Eremophila for Central Australia", 19:216 — Propagation, 19:221.

ERIOSTEMON — "The Genus" by Jean Galbraith. All species are described in serial form with part 1, 4:2 — part 2, 3:7 — part 3, the S.E. species, 6:9 — part 4, garden cultivars of *E. myoporoides*, 14:71 — part 5, the N.E. species, 15:95 — part 6, the W.A. species, 18:179, with a key to all Australian species, 18:180, correction, 20:295.

Eriostemon lanceolatus by R. Doney, 5:11 — *E. verrucosus* by M. McAllister, 6:12.

Eriostemon, How to Grow, 4:5 and To Propagate, 4:7, by W. Cane.

ERODIUM — *E. crinitum*, *E. cygnorum*, 19:217.

EUCALYPTUS — The large genus of trees commonly known as the Eucalypts or gum trees has not yet been extensively treated as we refer readers to "The Eucalypts" by J. L. Willis, 8:13. However the gardener will find a wide coverage in the following:

"Small Eucalypts to Suit Heavy Soils," 11:7 — "Eucalypts for Inland Areas," 8:14 — "Eucalypts in Other States," 8:15 — "Eucalypts in S.A.," 8:25 — "Eucalypts for Qld.," 15:79 — "Eucalypts for Central Australia," 18:170 — "Eucalypts for High Rainfall Areas," 14:67 — "W.A. Malley in Turrumurra. N.S.W.," 14:59 — "Growing Small Eucalypts",

- 11:10 — "*Eucalypts as Street Trees*" by J. Wallace, 14:49. Also 14:55, 10:9 and 11:8
11:10.
- "*The Bloodwoods*", 14:34 describes a special group of *Eucalypts* to support the following articles on the red flowering gum listed with other species given special treatment.
- Eucalyptus ficifolia*, "*The Red Flowering Gum*" by L. D. Pryor and R. R. Willing, 14:35.
- One of its diseases "*Red Stem Canker Disease*" is mentioned by J. S. Beard, 14:62.
- E. calophylla* var. *rosea* by J. E. Watson, 14:61. A disease free alternative to *E. ficifolia*.
- E. erythrocorys* by E. J. Thompson, 11:8.
- E. torquata*, Coogardie or Coral Gum, by E. J. Thompson, 10:9.
- "*Eucalypts for Your Garden*" and "*Eucalypts to Flower All Year Round*", 14:38.
- Propagation of *Eucalypts* is adequately described on 14:54-56 and 14:35.
- EVERLASTING — Well treated in issue no. 19 in the following:
- "*The Compositae or Daisy Family*" by J. H. Willis, 19:223 — "*Western Australian Everlasting Daisies*" by P. J. Parry, 19:210 — "*Some Showy Species of the Daisy Family in W.A.*" by Wittwer and Lullfitz, 19:211 — Daisies and Everlasting from Central Australia, 19:213.
- EWARTIA — *E. meredithae*, *E. nubigena*, 19:228.
- FLAVERIA — *F. australasica*, 19:231.
- GALEOLA — *G. foliata*, 16:123 — *G. cassythoides*, 16:125, 20:287.
- GLYCINE — *G. sericea*, 19:214.
- GOMPHOLOBIUM — All East Australian species are described in "*Gompholobium of N.S.W.*" by Colin Burgess and Loretto Williams, 18:185 — "*Gompholobium in Other States*", 18:195 and From Seed, 18:196.
- GREVILLEA — Not adequately covered — Refer Issue No. 21—Vol. 3.
- "*Grevillea banksii*", 15:81 and "*Queensland Grevillea*" by L. Cockburn, 15:81 describes nine good garden species from Qld., and 19:203 recommends two of these for Alice Springs.
- "*Grevillea From Seed*" by J. S. Howard adequately covers germination.
- GROWING NATIVE PLANTS — The principal theme of the publication.
- "*Hot Weather Gardening*" by J. Hammersley, 13:13 and "*Natives in Hot Weather*" by L. Baker, 13:13, are important articles for growers in hot dry areas.
- "*Mulching Techniques*", 12:18 — "*Sawdust as a Mulch*", 12:19 — "*Mulching with Sawdust and Shavings*", 12:19 and "*Mulching the Garden*", 13:14.
- "*Care of Native Plants*" by D. Ali, 12:2 stresses the need for cover plants and mulch.
- "*Ground Cover Plants*", 12:13 — "*Ground Cover Plants for Coastal Planting*", 12:15, 12:16 and "*Cover Plants for Qld.*", 12:13.
- "*Growing Plants in Pots*" by R. Hardie, 11:5 and "*Soil for Containers*", 18:181.
- "*Treatment of Plants with Magnesium Sulphate*" by H. Boyd, 13:6.
- "*Growing Wildflowers*" by E. Ashby contains sound advice.
- "*Central Australian Plants for the Garden*" by R. G. Swinbourne, Part 1, 18:170, Part 2, 19:213.
- HAKEA — A reference only to 3 species from Central Australia, 18:203.
- HARPULLIA — *H. pendula* by H. Oakman, 16:127 — A street tree.
- HELICHRYSUM — A reference to the genus and a few species, 19:213, 19:227, 19:241.
- HELIPTERUM — There is frequent mention of very good garden species in Issue No. 19.
- HIBISCUS — *H. farragei*, 19:215.
- INDIGOFERA — *I. leucotricha*, 19:214.
- KANGAROO PAWS — See *Anigosanthos*.
- KENNEDYAS by Alf Gray, 12:21 — All species are described.
- KUNZEA — A short reference only, 10:3, 20:270.
- LAMARCHEA — A short reference only, 10:3, 20:268.
- LEPTOSPERMUM — A short reference, 10:3 — *Leptosperminae*, a tribe of *Myrtaceae*, 10:19.
- LIPARIS — *L. coelogynoides* by C. K. Ingram, 13:29.
- LUISA — "*The Orchid*" by A. W. Dockrill, 13:26.
- LYPERANTHUS — "*In Australia*" by L. Cady. All species described, 12:9.
- MARIANTHUS — *M. erubescens*, 8:27.
- MELALEUCA — A very large genus, 10:23, 19:262. Half of the genus or Section A is described botanically by C. N. Debenham in serial form. All species described in this section are listed on 20:284, arranged in order of the native habitat with a number given to it in the descriptions as follows: Part 1, 10:23 (1-20) — Part 2, 13:23 (21-34) — Part 3, 17:156 (35-56) — Part 4, 18, 197 (61-67) — Part 5, 20:39 (68-73) — Part 6, 20:271 (74-81).
- "*Melaleuca in Cultivation*" by A. E. Brooks, 10:2 — "*Shrubs for Wet Conditions*" by I. G. Holliday, 10:4 — "*Growing Melaleuca*" by Holliday and Hill, 20:279 — "*My Melaleuca*" by A. L. Hargrave, 13:25 — "*Melaleuca neglecta*" by Fred Hall, 13:25 and "*Growing Melaleuca in Melbourne*" by I. Hammet, 20:286, covers growing conditions.
- "*Melaleuca as Street Trees*" by C. Johnson, 17:155 — *M. Styphelioides*, *M. linariifolia*.
- MICROSERIS — *M. lanceolata*, 19:230.
- MYRIOCEPHALUS — *M. stuartii*, 19:213.
- MYROCEPHALUS — *M. guerinii*, 19:241.
- MYRTACEAE — "*The Family*" by C. N. Debenham, 10:17.
- MYRTLES — See *Melaleuca*.
- NABONUM — *N. calyceroides*, 19:231.
- NAMING OF PLANTS by J. H. Willis, 3:12, 4:4—in reprints only.
- NOTOXYLIN — *N. pedatum*, *N. australe*, 19:215.
- NUXTIA — *N. floribunda*, The Christmas Tree of W.A. by L. O'Grady, 13:9.
- OLEARIA — General reference, 19:229 — *O. muelleri*, 19:241.
- ORCHIDS — Alternate issues deal with Epiphytal and Terrestrial Orchids.
- ORTHOCERAS — The Genus by Leo Cady, 1:8.
- Epiphytal Orchids — "*How to Grow*" by R. F. Leanev, 7:8 — Cultivation by N. R. Jupn, 11:11. "*Seed Germination*" by H. Boyd, 8:9, 9:29 and Natives From Seed, 11:31. "*Where They Grow*" by H. J. Bear, 9:25, 15:96.
- See also *Dendrobium*, *Luisa*, *Liparis*, *Sarcophytus*.
- Terrestrial Orchids — Growing by L. Cady, 8:1 and R. C. Nash, 18:171, 3:4. "*Orchid Seedlings*" by W. P. Stoutamire, Part 1, 16:119, Part 2, 20:264.
- See also *Chiloglottis*, *Dipodium*, *Diuris*, *Epiblema*, *Galeola*, *Orthoceras*, *Phaius*, *Spirulaea*.
- PAPERBARKS — 10:3. See *Myrtaceae*.
- PHAIUS — The Genus by W. H. Nicholls, 8:11 — The Orchid by R. F. Leanev, 8:3 — *P. nictus* by T. F. Hunt, 8:17. All species described.
- PHOTOGRAPHY — 12:25, 18:207.
- PODOLEPIS — *P. aristata*, *P. auriculata*, *P. lessonii*, 19:241.

POISONOUS PLANTS — Toxic Plants of W.A., 10:20.

PRESERVATION — "Preserving the Rare and Local Species" by J. H. Willis, 2:12—Reprints only. Perth's New Botanic Garden, 11:23.

PROSTANTHERA — The Genus by C. W. Althofer — A series to eventually describe all species. Part 1, 2, 3, *P. induta*, *P. megacalyx*, *P. nivea*, *P. ovalifolia*, *P. denticulata*; Part 2, 3:5, *P. suborbicularis*, *P. striatiflora*, *P. ovalifolia* — Part 3, 5:12, *P. nivea*, *P. phyllifolia*, *P. linearis* — Part 4, 9:19, *P. stricta*, *P. parvifolia*, *P. teretifolia*, *P. discolor*, *P. prunelloides*, *P. incana*, *P. rhombica*, *P. rotundifolia*, *P. striatiflora*, *P. aspalathoides*, *P. microphylla*, *P. calcina*, *P. arenicola*, *P. grylloana*, *P. magnifica*, *P. eckersleyana*.
PROTEACEAE — An introduction to the Genus by S. G. McKern, 1:5.

PTEROCAULON — *P. sphecelatum*, 19:213.

PTILOTUS — Pussy Tails from Central Australia, 19:215 — From W.A., 19:219.

PROPAGATION — The production of new plants by seed, cutting, etc. For a particular plant this aspect is usually mentioned in the same article describing the plant or genus of plants. As it is policy to include an article on propagation in each issue rather than index a lot of names or numbers and force the patient reader to look through them all, the Editor has attempted a review of the methods. For Orchids see under ORCHID.

PROPAGATION BY SEED — The mechanism of seed germination is described in "The Seed," 11:13 and Germination, 13:17, 14:44. Here requirements for a viable seed to germinate are Water, Temperature, Oxygen and Light. These are controlled by the propagating medium used, the condition in which it is maintained and its environment, the manner the seed is treated and sown.

Propagating Medium — Soil, 1:3; Loam and peat moss, 4:7; Vermiculite, 7:11.

Universal or Full Sun Method for most species. "Grow from Seed Without a Glasshouse", H. Boyd, 7:11.

Wet or Bog Method for plants enjoying wet conditions. "The Treatment of Seed Under Wet Conditions" by H. Boyd, 3:3 — 10:14.

Articles on other methods — These vary from reports by readers who use these methods 15:33 — 16:117. The usual seed box propagation used for exotics 4:7, 5:3, 5:17 to a near bog method, 15:103.

Treatment of Seed — Boiling water, 6:5 — 12:8 — Chemical action, 2:5 — Mechanical damage, 12:6 — Peeling off Testa, 15:83.

Germination prior to planting, 12:17, 1:4. A useful check.

Seedlings — Pricking, 7:22 — Nutrition, 13:6.

PROPAGATION BY CUTTING

"Native Shrubs from Cuttings" by H. Brackpool, 17:147 and by G. H. Mattingly, 19:221 give methods for beginners.

Mist Spraying Techniques and Bottom Heating for the more difficult species are described by R. O. Johnston, 20:256 and H. Boyd, 17:146.

Stimulation of Cuttings is mentioned by H. Boyd, 5:19, 17:146.

PROPAGATION AIDS

"Propagating Frames for the Home Gardener" by R. Hardie, 14:47. Also 19:221 and 20:256.

PROPAGATION BY GRAFTING

Methods described for "The Red Flowering Gum," 13:35, can be widely applied.

RHODODENDRON — "The Mystery Of" by C. Morrison, 9:9. *R. lochae*, 15:87.

ROCKERY PLANTS — From Central Australia, 19:217.

RUTIDOSIS — *R. helichrysoides*, 19:214.

SARCOCHILUS — *S. falcatus* by R. F. Leaney, 6:23.

SARCOSTEMMA — *S. australe*, 19:217.

SAUSSUREA — *S. affinis*, 19:230.

SCHOENIA — *S. cassimiana*, 19:241.

SEED — See Botany and Propagation.

SENECIO — *S. gregori*, *S. magnificus*.

SIGESBECKIA — *S. orientalis*, 19:231.

SINOCA — A passing reference, 10:3.

SPICULEA — The Genus in Australia by L. Cady, 10:11.

STERCULIA — *S. quadrifida* by K. Kennedy, 15:88 — *S. laurifolia* by C. N. Debenham, 15:89.

STURTS DESERT PEA — See *Clianthus*.

STYLIDIUM — An Introduction by Rica Erickson, 9:15 — Triggers for the Garden, 9:31.

STREET TREES — Each issue features an Australian tree as a Street Tree.

Brassia actinophylla, 15:25 — *Buckinghamii celsissima*, 19:245 — *Callistemon viminalis*, 13:21.

Cupaniopsis anacardioides, 13:183 — Eucalypts as Street Trees, 14:49, Lists many species

suitable for dry areas — *E. torquata*, 10:9 — *E. erythrocorys*, v1:9 — *Harpullia*

pendula, 16:127 — *Melaleuca* as Street Trees, 17:155, *M. styphelioides*, *M. linariifolia* —

An introduction to the Street Tree Section, 9:22 — A Report, 12:27.

TEA TREES, 10:3. See *Melaleuca*.

TELOPEA — "How to Grow Waratah" by P. J. Parry, 1:1 — "The Genus Telopea" by J. L.

Willis, 1:7 — "Nutrition of Waratahs" by N. J. Hannon, 1:13 — "How Do Waratahs

Grow?" by H. G. Bleakley, 1:15 — "How I Grow Waratahs" by H. Brackpool, 1:6,

20:259 — Growing Waratah, 20:259.

TREES — For Queensland — Part 1, Introduction, 17:161 — Part 2, 13:184.

UMBRELLA TREE — See *Brassia actinophylla*.

VERNONIA — *V. cinerea*, *V. scandens*.

VERTICORDIA — Some Observations by W. N. B. Quick, 3:13. The habitat of 5 species

are observed and their cultivation and propagation discussed.

"Verticordia in South Australia" by K. J. Stuckey, 3:11 — Experiences with 7 species.

"Verticordia Can Be Tamed" by R. Doney, 4:13. 12 species mentioned.

"Verticordia For the Garden" by W. A. Strutt, Part 1 "For Coastal Areas", 6:15 — Part 2 "For

Inland Areas," 13:17.

"Verticordia From Seed" by M. L. Roberts, 5:17 — Further notes 6:20.

WAITZEA — *W. acuminata*, *W. podolepis*, 19:241.

WARATAH — See *Telopea*.

WATTLE — See *Acacia*.

WESTERN AUSTRALIAN WILDFLOWERS — "North Western Australian" J. S. Beard, 19:218.

XANTHORRHOEA — *X. gracilis* by Gray and Strutt, 7:13.

Dendrobium Kingianum

Their Cultivation by C. M. Taylor

Dendrobium kingianum grows in large clumps, generally on rock faces and frequently in such a position that in times of heavy rain, large volumes of water flow over them. On close inspection most of these clumps of from 10-40 squares in area will be found to consist of plants with bulbs only a few inches long, while other plants only a few feet away will have bulbs 18" long.

The colour is just as variable ranging from pure white, through various shades of pink and pink spotted to a deep pink almost to red. In my opinion the colour variation has no relation to the size of bulb or locality.

An interesting observation is that when the plants are growing in a pocket of rich leaf mould, aerial growths are conspicuous by their absence. When growing in heavy shade the plants are spindly with aerals and poor root systems. In artificial cultivation (garden bush house) it has been found that a healthy plant with good roots rarely produces aerals thus indicating that "*Kingianum*" in common with many other *Dendrobes*, produces aerals in an effort for survival when cultivation is not good.

I have found that the best manner of cultivation is to discard the old plant and grow on from aerals, thus getting a shapely plant with all growth coming from the central rhizome.

D. Kingianum will respond to regular careful feeding. Artificial manures have some beneficial results but great care is needed in their application. If fowl or cow manure is used either liquid or dry, after the new growth is a few inches high, a very strong good flowering plant will be the result. Give the plants good light and in the growing season, water freely.

GREVILLEA IN ADELAIDE—continued from page 17

and magnificent heads of cream flowers which rise several feet above the foliage.

GREVILLEA OLEOIDES and Var. DIMORPHA (Olive Grevillea)

Small shrubs to 3ft. high with shining green leaves and bright red flowers clustered along the branches. The variety *dimorpha* has narrower leaves.

GREVILLEA PINASTER — small shrub with lovely foliage and masses of red flowers. Does well on alkaline soils. See photograph on page 36.

Other *Grevillea* that are adequately described elsewhere, that have done well here are *Grevillea robusta*, *G. banksii*, *G. rosmarinifolia*, *G. tridentifera*, *G. nematophylla*, *G. hookeriana*, *G. laurifolia* and *Grevillea lavandulaceae*, probably the best of the red *Grevillea* if a good form is chosen.

DENDROBIUM DISCOLOR LINDL.

A REVIEW OF THE SPECIES IN AUSTRALIA by A. W. Dockrill

In this paper *Dendrobium fuscum* Fitzg. is reduced in status to a variety of *D. discolor* Lindl., *D. undulatum* R.Br. var. *broomfieldii* Fitzg. is reduced to a form of *D. discolor* Lindl. var. *discolor*, *D. undulatum* R.Br. var. *carterae* F. M. Bail is reduced to a synonym of *D. discolor* Lindl. var. *discolor* forma *broomfieldii* (Fitzg.) Dockr. and *D. undulatum* R.Br. var. *fimbrilabium* Reichb. F. is given a new combination as a variety of *D. discolor* Lindl.

Dr. A. D. Hawkes, Aust. Orch. Rev. 28, No. 3:152 (Sept. 1963) indicated that the name *Dendrobium undulatum* had been used by Persoon in Syn. 2:524 (1807) and that consequently the name *D. undulatum* R.Br., (Prodr.) 332 (1810) was not acceptable for the Australian plant and that the next name used for this latter plant and the name by which it should now be known, was *D. discolor* Lindl., Bot. Reg. Pl. 2, Misc. 21 (1841). Dr. Hawkes made no effective transfer of any of the varieties etc. of *D. undulatum* R.Br. to *D. discolor* Lindl., and the present paper, at the suggestion of Dr. Hawkes, is an endeavour to overcome this need as far as the Australian forms are concerned.

Lindley's *Dendrobium discolor* is an extremely variable species and as has been recognised by most botanists familiar with North Queensland species of *Dendrobium*, Fitzgerald's *D. fuscum* falls well within the variation of Lindley's species and consequently is not deserving of species rank. *D. undulatum* R.Br. var. *broomfieldii* Fitzg. is merely a colour form, a striking one notwithstanding, of the type variety of Lindley's species, showing no morphological differences from this latter plant and consequently is not deserving of varietal status. Bailey's var. *carterae* is also a yellow-flowered form of the type variety of Lindley's species and as such, should be included in *Forma broomfieldii*.

A systematic treatment and description of the Australian forms of *D. discolor* Lindl. will follow:

Dendrobium discolor Lindl., Bot. Reg. Pl. 2, Misc. 21 (1841); A.D. Hawkes, Aust. Orch. Rev. 28, No. 3:152 (Sept., 1963).

Syn.: *D. undulatum* R.Br., Prodr. 332 (1810); Lindl., Gen. et Orch. 87 (1830); Benth., Flor. Austr. 6:279 (1873); Fitzg., Aust. Orch. 2:Pt. 3 (1888); F. M. Bail., Qld. Flor. 5:1525 (1902); Rupp & Hunt, Proc. Linn. Soc. N.S.W. 72: 249 (Jan. 1948) Non Persoon, Syn. 2:524 (1807).

A complex species of at least 3 varieties and one form (as well as the type form) occurring in Australia.

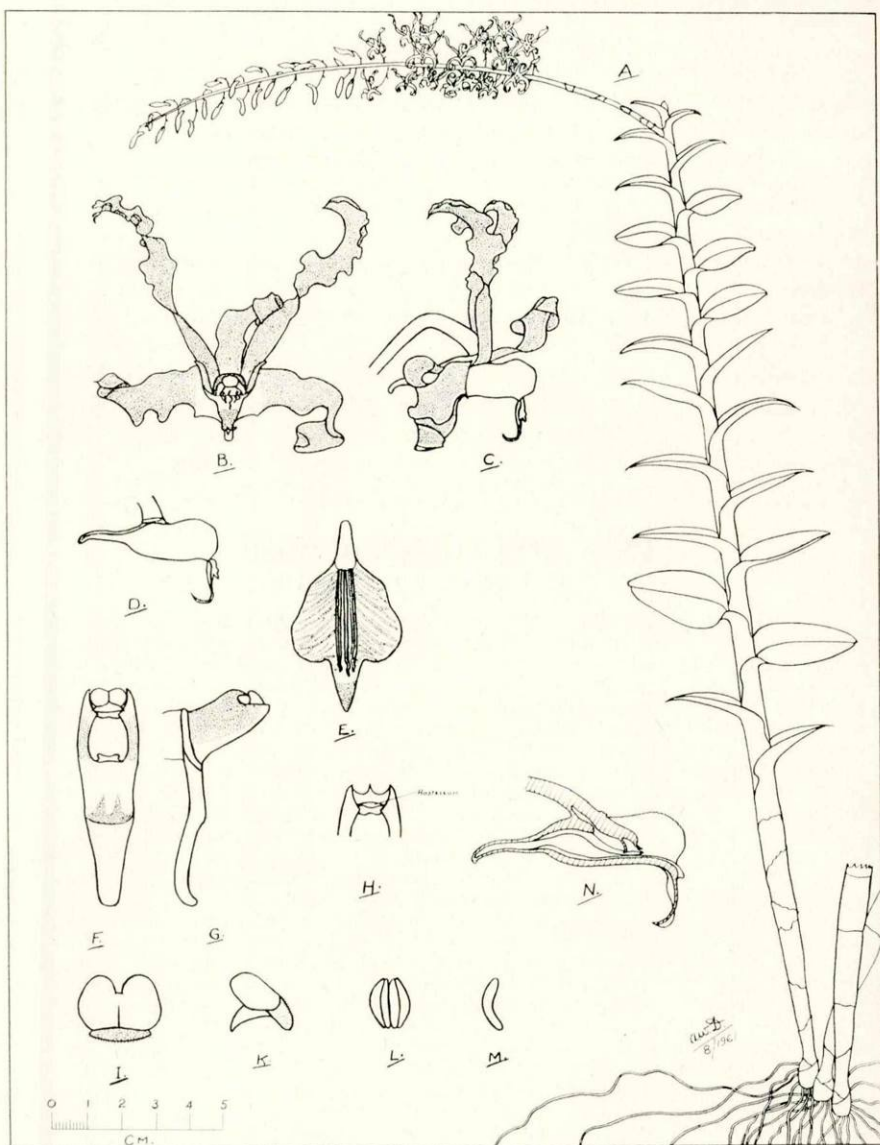
1. Var. *discolor*.

A. forma *discolor*. (The "Golden Orchid" of Queensland).

A very large and striking member of the genus, common in its habitat, where it grows on trees, rocks or even on the ground where the soil is sandy and well drained.

Stems (pseudobulbs) growing in large tufts, 30-500 x 1.5 cm., somewhat swollen in the middle and at the very base, leafy in the upper 2/3rds. Leaves 5-12 x 2.5 cm., ovate or elliptical, obtuse or emarginate, flat or concave, straight, decurved or recurved. Racemes 1 to about 6 or more from the upper nodes, 20-60 cms. long. Flowers, on pedicels 2-3 cm. long, numerous, 3-8 cm. diam., widely expanding, dingy yellowish-brown, golden-brown or bronze, segments undulate and twisted to varying degrees. Dorsal sepal 1.5-4.0 x 0.3-0.6 cm., narrow, oblong, obtuse or acute, twisted, curled, margins undulate. Lateral sepals 1.5-4.0 x 0.3-0.6 cm., triangular-oblong, obtuse or acute, usually recurved, somewhat twisted and the margins undulate, joined at their bases at the back to form, with the column foot, a narrow, straight or curved obtuse spur (mentum). Petals 2.5 x 0.4-0.8 cm., suberect, narrow-oblong or narrow obovate, twisted, margins undulate. Labellum 1.5-2.5 x 0.8-1.5 cm. (when flattened), trilobate; lateral lobes erect, 3-5 x 8-15 mm., transverse-oblong or subrescent; mid-lobe 3-8 x 1.5-3.0 mm., + triangular-acute, decurved, margins undulate; disc usually white or violet with 3 main longitudinal ridges which are indistinct in the posterior half but become prominent in the apical half where they are sinuate and extend on to the

mid-lobe, on the outside of these 3 ridges are 2 less distinctive ones which do not extend on to the mid-lobe, sometimes between the 3 main ridges, where they are prominent, are 2 short sinuate ones. Column prominent, 3-6 mm. long, stout, with a foot 5-10 mm. long base of the labellum to form a flattened hollow-cylindrical spur. Stigma oblong. Rostellum almost at right angles to it; foot tapered towards its apex and its apical half fused with the the merest extension of the floor of the clinandrium. Anther with an extremely short, very broad, crescentic, minutely hirsute rostrum. Pollinia $\pm$ typical of those of the genus.



DENDROBIUM DISCOLOR LINDL. var. *DISCOLOR*

- A. Portion of plant $\times \frac{1}{4}$ indicated scale.
 B. Flower from the front—to scale $\times 2$.
 C. Flower from the side—to scale $\times 2$.
 D. Labellum from the side—to scale $\times 2$.
 E. Labellum flattened out—to scale $\times 2$.
 F. Column from the front—to scale $\times 4$.
 G. Column from the side—to scale $\times 4$.
 H. Top of column (anther removed)—to scale $\times 4$.
 I. Anther from above—to scale $\times 10$.
 K. Anther from the side—to scale $\times 10$.
 L. Pollinia from the front—to scale $\times 10$.
 M. Pollinum from the side—to scale $\times 10$.
 N. Longitudinal Section of Column and Labellum $\times 3$.

Distribution:— From about Cape Curtis (Gladstone) to Cape York (Somerset) in Queensland, extends to most of the islands of Torres Strait, Southern New Guinea and the Solomon Islands.

Flowering Period:— Usually July to December.

B. *Forma broomfieldii* (Fitzg.) Dockr., Stat. Nov. et Comb. Nov.

Syn.: *D. undulatum* R.Br. var. *broomfieldii* Fitzg., Aust. Orch. 2:Pt. 3 (1888) F. M. Bail. Qld. For. 5:1525 (1902); *D. undulatum* R.Br. var. *carterae* F. M. Bail., Comp. Cat. Qld. Pls. 524 (1909); et Contrib. Qld. Flor., Qld. Agri. Journ. 305-306 (Dec. 1911).

Plant similar to that of *forma discolor* but flowers canary-yellow with the ridges of the disc of the labellum usually white. In some specimens the yellow colouring is very bright and shining, quite enamel-like.

2. var. *fimbriolabium* (Reichb. F.) Dockr. Comb. Nov.

Syn.: *D. undulatum* R.Br. var. *fimbriolabium* Reichb. F., Gard. Chron. 1:40 (1878).

Plant similar to that of var. *discolor* but flowers with a labellum which has fimbriate lateral lobes.

Distribution:— uncertain. Most areas in which var. *discolor* occurs in quantity.

3. var *fuscum* (Fitzg.) Dockr. stat. Nov. et Comb. Nov.

Syn.: *D. fuscum* Fitzg., S.M.H. 24/9/1879; et Gard. Chron. 11:680 (1879); et Ined. Mitchell Lib. No. 83.

Plant similar to that of var. *discolor*. Flowers seldom exceeding 4 cm. diam., sepals and petals reddish-brown with paler margins. Sepals averaging about 2 cm. long, margins not undulate. Petals averaging about 2.5 cm. long, not greatly twisted, but margins near the apex undulate.

Editor's Note: Once again I regret that I could not obtain a suitable colour slide for a colour plate of these plants. Photographers, get busy next season.

THE PITTOSPORUMS

AS STREET TREES by H. Oakman

The Pittosporums are brush and rain forest trees which do well under cultivation. The most popular is *Pittosporum undulatum*, often referred to as Mock Orange, and this species has occasionally been used as a street tree in New South Wales and Victoria. Under forest conditions it develops a columnar trunk and will grow up to 80ft. But in the open it is of a naturally bushy habit and it must be trained to form a trunk when used as a street tree thereby necessitating fairly regular attention for the first three years. In good soil it is a fast grower and develops dense branching and foliage. In Springtime it has a mass of creamy white, very fragrant flowers which last for about three weeks. Its foliage is quite attractive, leaves are 3-5 inches long, lanceolate, and dark green. The flowers are followed by 1/2" round, yellow seed capsules, which split open to display ruby-coloured seeds, these are coated in a sticky substance which, while it helps in seed dissemination, detracts from the popularity of the tree. Propagation is almost invariably from seed.

The chief disadvantage it has is being prone to Indian Wax and the associated sooty mould. When the attack is severe the trees are quite unattractive and control is, of course, tedious and expensive. The bark is greyish and sand-papery in texture. One merit this tree has is its ability to withstand mild sea breezes, making it a useful subject for coastal plantings, provided the position is not too exposed. It is also fairly adaptable to both sand and clay, although preferring rich soil. Its tendency towards low-branching and its denseness make it an ideal choice for tall hedges and wind breaks.

Pittosporum rhombifolium is another native that has been occasionally used for street tree planting. It is an excellent tree for this purpose but has never gained the popularity that it deserves. Possibly this is due to failures which inevitably occur if the tree is given an unfavourable situation. It is a native of the rain forests where there is rich soil and no lack of moisture together with protection. Given conditions that approximate to this, it will grow into an excellent, well-established street tree, producing cream coloured flowers in late Spring, followed by a very dense cover of yellow capsules each with two black seeds. These are quite showy and last until almost mid-Winter. This *Pittosporum* is propagated from seed and young plants tend to be slow growing for the first two or three years. There is also some variation in rate of growth

and it would be advantageous to plant out only well-advanced evenly sized specimens that have been forced into growth and have not been retarded before planting out. Leaves are glossy green and diamond-shaped which has originated the seldom used common name, diamond-leaved laurel.

Pittosporum phylliracoides. This *Pittosporum* is native to the eastern part of Australia and although it has been grown as an ornamental it does not appear to have been used as a street tree. However, it should be useful in the dryer western districts as it is quite drought resistant. This *Pittosporum* grows into a small tree with pendulous branches and willow-like leaves. During Spring and early Summer it is covered with oval fruits, $\frac{3}{4}$ inch in size and varying in colour, from green to yellow and bright orange, which make it a very attractive subject. It can stand fairly regular pruning, but requires staking while young to induce upright growth. As the foliage is edible to cattle it is advisable not to plant it where there is straying stock.

PITTOSPORUM

THE GENUS by H. C. Hayes

(From the gummy matter surrounding the seeds)

Petals usually connivent or cohering in a tube at their base or above the middle. Anthers ovate-oblong. Ovary sessile or shortly stipitate, incompletely or almost completely 2 celled, or rarely 3 to 5 celled; style short. Capsule globose, ovate or obovate, often laterally compressed; the valves coriaceous or thick and hard, bearing the placentas along their centre. Seeds thick or globular, not winged, often enveloped in a viscous liquor—shrubs or trees, glabrous or rarely tomentose. Leaves usually evergreen, entire or minutely toothed, the upper ones frequently collected into a false whorl. Flowers not large, axillary or terminal, solitary or in close corymbose panicles.

A large genus, dispersed over the warmer regions of Africa, Asia, the Pacific Islands, and New Zealand. The Australian species are all endemic excepting one which is common to eastern tropical Asia and eastern Archipelago.

KEY TO SPECIES

- Flowers numerous, small, in compound terminal corymbs, with the lower branches axillary.
- Leaves ovate-rhomboid, toothed. Sepals obtuse *P. rhombifolium* (1)
- Peduncles all terminal, clustered, short, each bearing a short simple cyme or umbel. Glabrous, or the young shoots and inflorescence very slightly pubescent. Flowers about $\frac{1}{2}$ in. long *P. undulatum* (2)
- Young shoots and inflorescence rusty tomentose or hirsute. Flowers about $\frac{1}{2}$ in. long *P. revolutum* (3)
- Capsule $\frac{3}{4}$ in., very rough
- Pedicles axillary, solitary or clustered, 1-flowered, the uppermost sometimes in a terminal cluster. Leaves glabrous, flat. Flowers yellow *P. phylliracoides* (4)
- Flowers 3 to 4 lines. Capsule $\frac{1}{2}$ in. Leaves on long petioles. Ovate to oblong lanceolate. Tomentum short and crisp, ferruginous *P. ferrugineum* (5)
- Leaves oblanceolate, aristate. Sepals broadly ovate *P. setigerum* (6)
- Leaves from obovate to oblong or lanceolate, quite entire. Sepals subulate or subulate-pointed. Plant glabrous *P. melanosperrum* (7)
- Veins of the leaf dark-coloured, 8 to 10 lines *P. venulosum* (8)
- Leaves of thin texture, petioles of medium length. Capsule velvety *P. wingii* (9)
- Leaves nearly sessile, oblong-lanceolate. Tomentum almost hirsute, very dense *P. rubianosum* (10)
- Spinose, flowers solitary on arrested branchlets *P. O'reillyanum* (11)
- Leaves tomentose beneath; petals yellow marked with red to purplish-red; capsule valves coriaceous, less than 1mm. thick *P. bicolor* (12)

(1)

PITTOSPORUM RHOMBIFOLIUM A. CUNN.

A glabrous tree with a smooth grey bark sometimes attaining a height of 50ft. Leaves alternate or approximated in groups of 3-5 at ends of branches or at nodes, rhomboid-oval or broadly lance-shaped 2-4in. long, margins toothed in upper part, entire and straight lower half narrowed into a petiole of $\frac{1}{2}$ to 1in. Venation distinct both surfaces.

Flowers small, white, numerous in a dense terminal corymb, the branches sometimes minutely glandular.

Fruit yellow, pear-shaped about $\frac{3}{8}$ in. long each containing 2-3 black seeds.

Habitat—From the Clarence River, N.S.W. to Proserpine, Queensland.

Wood almost white, hard and close-grained, suitable for carving.

Flowers in November, December and January.

Vernacular names—White Myrtle, Diamond-leaf Laurel, Rhombus-leaved Queensland Laurel.

(2)

PITTOSPORUM UNDULATUM VENT.

A tree, attaining in favourable situations 40ft. but in luxuriant rain forest 50ft. Quite glabrous, except a slight appressed pubescence on the young shoots and

inflorescence. Leaves from oval oblong to lanceolate 3-5 in. long approximated in groups of 3-6 at ends of branches or at nodes, margins wavy, coriaceous and shining above, narrowed into a petiole 3/8-5/8 in. Venation inconspicuous. Flowers white, fragrant, in terminal clusters much shorter than the leaves, mostly bearing a simple cyme or umbel of 3 or 4 flowers. Capsule yellow, globose, 3/8-1/2 in. diameter containing numerous ruby-coloured seeds. Habitat—from the Victorian Alps to Logan River, Queensland.

Wood pale, close-grained, hard and tough, considered suitable for carving engraving, golf-heads, etc.

Flowering in September.

Vernacular names—Wave-leaved Pittosporum, Engraver's Wood, Box Tree, Mock Orange Native Laurel, Victorian Laurel.

(3)

PITTOSPORUM REVOLUTUM AITON

A shrub, the young shoots hairy. Leaves approximated in groups of 4-8 at ends of branches, stalks 3/8-3/4 in., blades ovate-elliptical or elliptical-oblong acute to shortly acuminate 2 to 4 in. long occasionally undulate dull green and glabrous above, clothed underneath with a loose rusty tomentum easily rubbed off. Peduncles terminal, few or solitary, usually decurved, bearing sometimes a single rather large flower, but more frequently a short dense ovate or corymbose raceme. Petals yellow nearly 1/2" long, often united to above the middle, shortly spreading or recurved at the top. Fruit a capsule egg-shaped 1 in. long almost woody, opening in 2 or 3 valves, seeds globose numerous with sticky surface.

Habitat—from south-east Gippsland, Victoria to Gympie, Qld.

P. revolutum is not often seen in cultivation as it seems to require shade and protection for its successful cultivation.

Vernacular names—Wild Yellow Jasmine, Yellow-flowered Brisbane Laurel, Genoa Pittosporum (Victoria).

(4)

PITTOSPORUM PHILLYRAEOIDES

A small graceful tree or slender shrub with pendulous branches, greyish brown, tomentose when young, soon glabrate. Leaves alternate usually oblong or linear-lanceolate with a small hooked point 2 to 4 in. long. Quite entire, thick coriaceous and indistinctly veined margins flat or revolute petioles 4-15 cm. long. Flowers yellow, usually about 4 lines long, solitary or in sessile or shortly pedunculate clusters or umbels, or the uppermost forming a terminal cluster. Often dioecious the females rather larger and fewer together than the males. Capsule ovate or round-cordate, much compressed, quite smooth. Varying from 4 to 9 lines in length, but usually about 1/2 in.

Habitat—An inland species which occurs throughout Australia.

Vernacular names—Berrigan, Butter-wood, Locket Bush, N.S.W.

Flowers from July to October.

(5)

PITTOSPORUM FERRUGINEUM AITON

A tree, flowering sometimes as a shrub, but attaining a height of 50 to 60 ft., the young shoots thickly clothed with a loose rusty tomentum which wears off. Leaves from obovate or ovate, and obtuse or scarcely acuminate, to oblong or almost lanceolate acuminate 3 to 4 in. long, quite entire, narrowed into a petiole 1/2 to 3/4 in. rusty-tomentose on both sides when very young, but glabrous above, or on both sides when full grown. Flowers terminal or axillary, rather small, in cymes or umbels, petals narrow, about 3 lines long, spreading above the middle. Capsule sessile globose, 2 valved scarcely 4 lines broad containing usually 15-16 black seeds.

Habitat—Occurs mainly on the coast from Rosedale to Cape York, Queensland. From the Solomon Islands to the Nicobar Islands and Malaysia.

Flowers from June to August.

Vernacular name—Rust-leaved Pittosporum.

(6)

Queensland Species from the Queensland Flora

P. setigerum (bristle bearing) Bail. A small glabrous tree. Branchlets furrowed, with the bark often reddish. Leaves coriaceous, the reticulate veins close and raised, 2 1/2 to 4 in. long, 3/4 to 1 in. wide, tapering from above the middle to a rather long slender petiole, the apex terminating in a prominent bristle. Flowers, judging from the dried ones, seemingly light-yellow in a broad-spreading terminal panicle longer than the leaves. Pedicels slender, sepals broadly ovate, minute. Petals free, patent, about 2 1/2 lines long, obtuse, veins obscure.



Colour photography by Frank Hurley

Block by courtesy of John Sands Pty. Ltd.

PITTOSPORUM REVOLUTUM

Stamens shortly exceeding the petals. Ovary on a short glabrous stipe, densely covered with a white tomentum. Capsule globose, 4 lines diameter, exuding an amber-coloured resin or gum. Seeds black, angular, from 2 to 6 in each capsule.

Habitat—Walsh River, North Queensland. T. Barclay—Millar.

(7)

P. melanospermum (black seed), F. V. M. Frag. i. 70 Benth. Fl Austr. i. III. A small tree, quite glabrous, or with a scanty minute glandular pubescence on the inflorescence. Leaves from obovate to oblong or even lanceolate, shortly acuminate, mucronate or obtuse, 2 to 4 in. long entire and flat or slightly undulate on the margin, narrowed into petiole of 4 or 5 lines. Coriaceous, but not shining, of a pale hue and prominently veined. Corymbs compound, terminal, many-lanceolate-subulate, the petals 3 or scarcely 4 lines long, spreading from about the flower, but shorter than the last leaves. Flowers small, the sepals subulate or middle. Ovary shortly stipitate, with 10 to 12 ovules to each placenta. Capsule obliquely globular or pear-shaped, somewhat compressed, with a few or sometimes a single black seed.

Habitat—Tropical parts of Queensland.

(8)

P. venulosum (leaves beautifully veined) F.V.M. Fragn. vi. 186. A small tree of about 30ft. high; the ultimate branches almost verticillate slightly ferruginous—tomentose. Leaves lanceolate or ovate-lanceolate acuminate, almost whorled 2 to 4in. long, $\frac{3}{4}$ to $1\frac{1}{2}$ in. broad, the reticulations close and deep-coloured, margins thickened, tapering to the petioles. Flowers in a terminal corymbose panicle. Capsule globose-pyriform, 2 rarely 3-valved, slightly compressed, 8 to 10 lines long, yellow inside; seeds 1 to $1\frac{1}{8}$ line long.

Habitat—Ranges of the tropical Coast, as Rockingham Bay, etc.

(9)

P. Wingii F.V.M. Leaves of almost herbaceous texture, on very short stalks, ovate or elongate-lanceolate, acuminate, hardly or slightly recurved at the margin, beneath prominently penninerved and as well as the branches brownish silky-tomentose; corymb. umbelliform; solitary short-stalked or almost sessile; sepals velvet-hairy, narrow-lanceolate, gradually pointed; corolla about one-third longer than the calyx, its tube widened upwards, shorter than the bluntish and not much-spreading lobes; anthers fully half as long as the filaments, many times longer than broad; ovary brownish-silky; capsules not large, rather turgid, almost globular or somewhat depressed, velvet-hairy, valves 2, hard; funicles thick and very short, seeds several, from garnet colour turning brown-black, somewhat viscid.

Habitat—Bellenden Ker and other high ranges of the tropical parts of the colony.

(10)

P. rubiginosum (foliage reddish coloured). A Cunn. A sparingly branched shrub, the branchlets, petioles, and inflorescence densely clothed with a rust-coloured tomentum, consisting of much more spreading hairs than in **P. ferrugineum**. Leaves almost whorled, oblong-lanceolate, acutely acuminate, 5 to 10in. long, entire or slightly sinuate-toothed, narrowed at the base, but almost sessile, herbaceous, glabrous above, softly pubescent underneath. Peduncles stout. Sepals with scattered hairs, the petals 3 times as long as the sepals, cohering for about two-thirds of their length into an almost cylindrical tube, thin summits pointed and much recurved; filaments twice as long as the anthers. Capsule large, rugose, ovate-cordate, deep yellow.

Habitat—Common on the ranges about Bellenden Ker.

(11)

PITTOSPORUM O'REILLYANUM WHITE

A shrub spinose, brown, tomentulose when young, soon glabrate. Leaves alternate, sometimes clustered on the branchlets, ovate to elliptic-oblong, acute to cuspidate at apex, obtuse at base, entire 2-5in. long, green above, paler beneath with a sparse tomentum when young, soon glabrous, margins flat or recurved, petioles up to 1m. long. Flowers axillary of terminal on arrested branchlets, solitary cylindrical or slightly tubular. Petals 6.0-9.5 mm. long, 1.2-1.5 mm. broad on pedicels 1-2mm. long. Capsule globose 2 valved, 7-12mm. broad, smooth.

Habitat—Occurs at high altitudes in south east Queensland.

Flowers in September-October.

(12)

PITTOSPORUM BICOLOR

A shrub or small tree to 40ft. high, branchlets greyish-brown, the young parts of first rusty-tomentose but soon becoming glabrous. Leaves alternate, oblong-lanceolate to linear, obtuse or apiculate at apex 2-5in. long, glaucous-green and glabrous above yellowish to brown-tomentose beneath, coriaceous, margins revolute, midrib and lateral nerves usually distinct above, midrib alone distinct beneath petioles 2.5 mm. long hairy when young. Flowers axillary, solitary, or fascicled, clustered at the ends of leafy branchlets. Flowers yellow or yellow marked with red or reddish-purple, petals lanceolate-oblong 9-15mm. long, 2-4mm. broad. Capsule almost globose, 2 valved, 7-13mm. in diameter, slightly tomentose, seeds 10-20 pale reddish to reddish-black, irregular.

Habitat—Tasmania, Victoria, Southern N.S.W.

Flowers from July to December.

Vernacular names—Whitewood, Tallow-wood, Tolosa-wood, Dragon's Blood, Pittosporum (Tasmania), Cheesewood (Victoria), Banalla (Victoria, aboriginal). **P. bicolor** is cultivated in California and England.

Queensland Pittosporum

by LEN MILLER

The *Pittosporum* is a member of the *Pittosporaceae* family which includes *Hymenosporum*, *Bursaria*, *Marianthus*, *Citriobatus*, *Billardiera* and *Cheirantnera*. It derives its name from the gummy substance surrounding the seeds.

According to Bailey there are ten species in Queensland, being widely dispersed, from the southern border to the tropical north and inland to the eastern Downs. All are indigenous to this country except one, this being *P. ferrugineum* which extends to the Malaysian peninsular and the adjoining islands and the Philippines. The Australian form has rather larger flowers and narrower pointed sepals than the common Malayan form.

Of the ten varieties, six are from the tropical north mainly being found on the ranges which would naturally be, more or less, rain forest types. Foliage on these varieties is fairly large some leaves measuring up to ten inches in length by two inches broad. These tropical types would be most unsuitable for southern gardens but could possibly be grown in sub-tropical areas where they could be protected from frost.

A quick run through these varieties thus:-

P. steigerum, a small glabrous tree, leaves to 4 inches long by one inch wide, veins close and raised, large heads of flower, light yellow in colour.

P. melanosperrum, a small tree, leaves obovate to four inches long, pale in colour and prominently veined.

P. revolutum, a tall shrub, the young shoots tomentose, leaves elliptical 2 to 4 inches long, the underside being covered with a rusty coloured "bloom."

P. venulosum, a tree of some 30 feet, leaves lanceolate, veins being close and deep coloured, flowers borne in panicles.

P. ferrugineum, ultimate height 50 ft., young shoots covered with rusty coloured "bloom", leaves lanceolate or obovate.

P. rubiginosum, as the name suggests the growth on this specie is covered with a rust coloured tomentum. The leaves are large, lanceolate, measuring up to 10 inches long.

Of the varieties suitable for garden cultivation and one which is very widely grown, *P. undulatum* is a handsome tree. In its native habitat, ranges of Southern Queensland, it attains a height of 40 ft., but in drier and cooler areas this would be considerably reduced. It is an ideal tree for specimen, windbreak and avenue planting, its large dark green foliage is outstanding. Its natural habit of growth is pyramidal. The flowers are borne in heads and are white and sweet smelling (hence its name "Mock Orange.") The berries are most attractive too, being orange in colour, a big fault with this specie is its susceptibility to white wax scale.

P. phyllracoides is an excellent tree for planting in dry areas. Up here in Queensland it thrives in dry rocky country, with no ill effects. It is a graceful tree of some 15 feet or so, not over endowed with foliage, but most attractive. Leaves are long, 4 to 6 inches, and narrow, and are drooping in habit. Flowers are small and yellow, but not a floriferous tree. Does not set many seeds in a good season, probably one year in three would be good. Grows on the Eastern Downs at Linthorpe and Goombungee. Have not used this variety at all but would consider it to be a tree for street planting.

Completely Revised — Fourth Edition

SHRUBS AND TREES FOR AUSTRALIAN GARDENS

by ERNEST E. LORD, F.R.H.S.

Recognised as the complete reference book on the subject, this **FOURTH** edition has been almost completely re-written, and there are now over 3,500 different shrubs and trees from this country, New Zealand and overseas, described in detail and classified for growing under every possible condition.

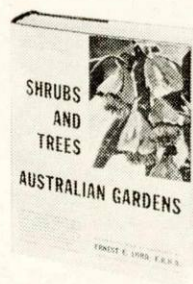
471 PAGES. SIZE 10" x 7½"

166 Illustrations — 18 in full colour

THE INDEX CONTAINS 6,650 ENTRIES

PRICE, £7/7/- (post 2/3).

OBTAINABLE FROM YOUR BOOKSELLER



Growing Australian Plants

by NOEL LOTHIAN & IVAN HOLLIDAY

Australia is a vast continent. Climatic conditions vary from desert areas to tropical, and each different environment throughout the continent has its own particular vegetation or plant species. Yet it is the wish of many to grow species from all these environments in a single habitat, namely, their own garden. If the gardener knows the conditions under which a plant flourishes in nature then he can simulate these conditions as near as possible.

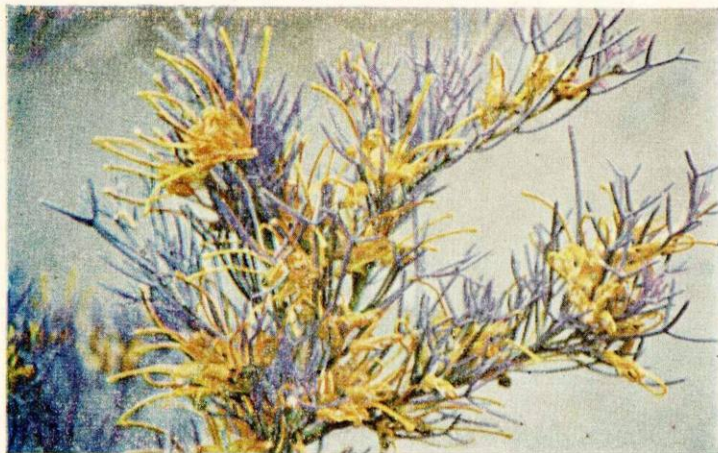
What is needed is for species that would make good garden subjects, to be grouped under habitat headings. The species should also be grouped into plant types; trees, medium to large shrubs etc., and further related to their suitability to soils and conditions. Particular emphasis should be made to the difficult clay soil problem such as occurs in Adelaide and some parts of Sydney.

Just what a home gardener needs you say. Where can I get this information in a simple easily read style with hundreds of the finest species fully described in my language? This is the text and style of a new 166 page book by the two authors above. Included also is a chapter on "Plant Propagation," another on "Planning the Garden" and many full colour plates, two of which are shown below and two more on page 45.

Excellent value at only 37/6 at your book seller. Review and recommendation, W. H. Payne.



GREVILLEA PINASTER



HAKEA PURPUREA

Photographs by Ron Hill

Hakea, or is it Grevillea. The above colour plate is not produced to confuse the reader. Closely related to *Grevillea* is the large genus *Hakea*, and the difference is not very obvious to the beginner. One difference is that *Hakea* has a hard woody seed case that often stays on the bush, where as with *Grevillea* the seed case is a leathery capsule that releases seed when ripe.

Hakea purpurea is a very fine specimen to 4 feet from Queensland.

The flower should be a bright red with green leaves. An unfortunate error occurred with the blocks and printing.

We will be treating *Hakea* shortly and members experiences or colour slides should be forwarded to the Editor.

THE SILKY OAK (*Grevillea robusta*)

H. OAKMAN

The silky oak is grown as an ornamental throughout Australia and does surprisingly well under conditions that are unlike those of its habitat. In its natural state it is found along the N.E. coastal fringe of Australia in open and rain forest areas with a rainfall varying from 25" to 50".

As a Street tree it has some disadvantages particularly its fastigate habit of growth which precludes positioning it under overhead wires. Its foliage is sparse, it dislikes regular pruning and the branches are brittle and its life span of 50 years is relatively short. The best location for the Silky Oak in streets is where there is deep, well-drained rich soil, shelter from strong winds, no overhead wires and preferably where the nature strip is wide enough to allow hedge type planting rather than in widely spaced rows so that the trees can be closely planted to protect one another.

When in full bloom the Silky Oak is a spectacular tree and from the point of view of display the best specimens are found north and south of the Queensland/N.S.W. border. Here they flower from late October to November, displaying a pyramid of orange-yellow flowers on leafless branches. In colder regions there is a tendency towards remaining evergreen with a consequent loss of brilliance.

Forest trees grow up to 100 ft. high but average height of plantation trees when fully grown is approximately 50ft. The young trees are very fast growing and almost invariably sparse in foliage and branching unless regularly pinched out to induce bushiness. Young branches are covered with rust-coloured hairs and are velvety in appearance. The leaves, 8 inches long, are pinnate and deeply lobed with recurved margins, smooth on the surface and silky underneath. The bark is furrowed and greyish brown, the flowers are a bright orange-yellow in racemes 3" to 5" of typical proteaceous form and produced on the old wood. The seed pods are boat shaped follicles $\frac{3}{4}$ inch containing flat papery seeds winged all round.

There are some 200 *Grevilleas* of which *G. robusta* is the largest. It was named by Robert Brown after C. F. Greville, a 19th century patron of botany. The common name was according to Hooker (1832) given to it by the Moreton Bay pine cutters because the timber resembled the English oak and was silky when newly split. The timber is sought after for cabinet work, it is a light soft wood, strong and tough with good figure.

Propagation is invariably from seed, growth is fast and the young plants are most attractive with brown-tipped fern like foliage. Overseas the young plants are used extensively as indoor plants and for outdoor bedding. Although early growth is rapid, flowers are seldom produced under seven years.

The Silky Oak is relatively pest free, can stand a short period of drought and has root growth that is seldom troublesome, these are factors that balance some of its disadvantages. However its ultimate height should be kept in mind so that winter shadows on residences will be avoided.

Another *Grevillea*, often referred to as the Red Silky Oak, *Grevillea banksii* known previously as the variety *fosterii*, is occasionally grown as a street tree and there are a few streets where this has been successful.

STREET TREES [*Grevillea robusta*]

by ROS GARNET

What of it as a street tree? What are its virtues? What are its undesirable characters?

Well, that depends where the street is located.

Bailey, in his Queensland Flora, notes it as a native of Southern Queensland, extending from Moreton Bay to many southern localities — "a tree sometimes small and slender, sometimes robust and 80 to 100 feet high."

The species also occurs naturally in New South Wales but does not extend further south into Victoria nor is it indigenous to South Australia or the Northern Territory and this would seem to suggest that the species might not thrive well far removed from its natural habitat. Yet those who have had the good fortune to roam from one end of the continent to the other will have seen Queensland's Silky Oak thriving to perfection in many unlikely places. Alice Springs is one such place—a town where one might expect to see only vegetation indigenous to arid places—trees like the Athol or Cedar. In the Alice it has achieved a good reputation for shapeliness, a capacity to survive with a minimum of watering and a rate of growth slow enough to pose few pruning problems to municipal authorities.

A good specimen tree is almost pyramidal in shape, spreading its lower limbs well above ten feet from the ground and, remembering that in 30 or 40 years' time it could stretch 80 or more feet toward the sky, the wise planter would make sure that its summit will rise to a place above where some power or telephone lines swing (if he can forecast that far ahead). A beheaded pyramid is a pitiful substitute for the beauty that nature creates.

The Silky Oak has several other good features which commend it as a street tree in localities suited to its needs. It does not "sucker." Its root system is fairly deep in the soil and tractable enough to withstand some pruning if needbe but, from all accounts, it is a rare circumstance when root pruning would be necessary. Such a one, is perhaps, when excavating a deep drain or conduit channel nearby.

The streets of the Alice and their 150 Silky Oaks, have their counterparts in many Australian municipalities. For example, at Gunnedah, 400 of these trees adorn the streets, ranging in age from two-year-olds of four feet to sixty-year-olds thirty-five feet high. How old will they be when they reach their hundredth foot? But, the people of Gunnedah have little need to be concerned about the future of their trees for *Grevillea robusta* may survive ten or fifteen generations of the people who enjoy the shade they provide. It is a good shade tree, one not so densely leafy that the grey skies of winter cannot be seen through the foliage.

In Victoria it is much less favoured than in more northerly areas as a street tree. Nevertheless, in some localities and situations it grows supremely well but a good deal more slowly than in the warmer north. Because of this slower rate of growth the tree has to withstand for a longer time the hazards which beset young and growing trees—broken branches and tops, carelessness, accident or vandalism. But then such hazards are common to all young trees whether they are in the streets or elsewhere.

We seem to have emphasized the virtues of our Silky Oak but surely it has some undesirable characters?

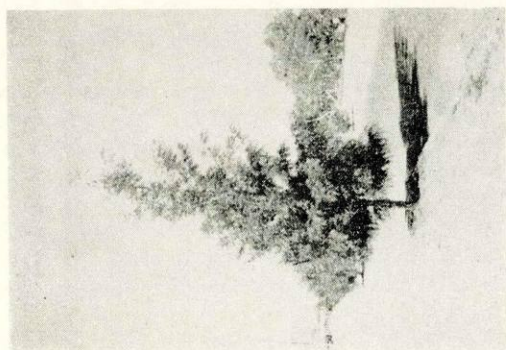
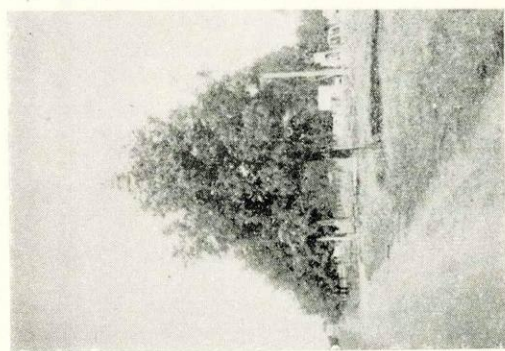


FIG. 1: A street tree in Alice Springs.

FIG. 2: Silky Oak in Marquis St., Gunnedah, N.S.W. Note the crown lopped because of overhead wires. Red gravelly soil.

FIG. 3: Oxley Hwy. (South St.) Gunnedah. The trees are 20 years old in hard red gravelly soil. Note that the tree line is a little to one side of the overhead wire line.

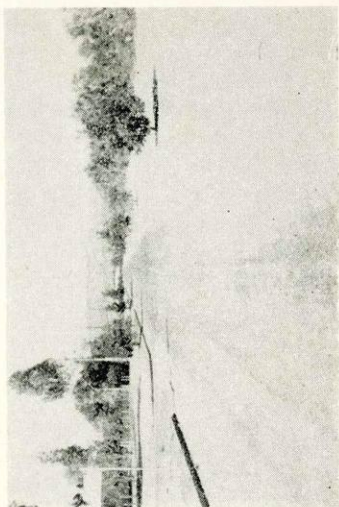
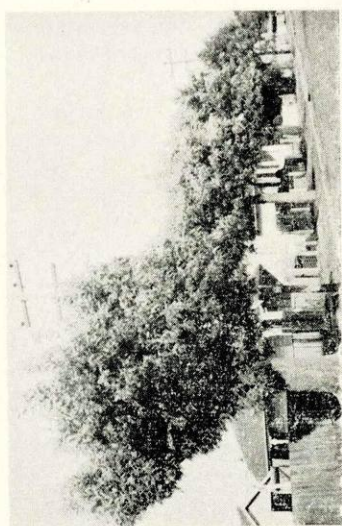


FIG. 4: The Silky Oak as a street tree in Muswellbrook, N.S.W.

FIG. 5: A street in Alice Springs lined with young Silky Oak Trees.

One possibly, is its habit, shared with most other non-deciduous trees, of shedding leaves in that irregular and untidy way so much deplored by those who have the task of keeping streets neat and tidy. The good old favourites—planes, poplars, oaks and ash—get the job over in a week or so (and, for several months of the year look like dead sticks) but our *Grevillea* may hold its leaves for two or three years and drop them with unpredictable irregularity in any of the four seasons. Consequently, it is always pleasingly umbrageous and, perhaps, unpleasing, slightly littered beneath with dead leaves but when it flowers, as it does from Spring to Autumn (according to seasonal conditions as much as to situation) it become a blaze of gold until the big combs of spider flowers fall to mingle with the blackened fallen leaves.

THE PLANT BODY

Helen Lee

Externally, the plant body can be divided into various organs. Three of these, the leaf, the stem and the root are vegetative organs and the flower is the reproductive organ. Internally, the organs are composed of various tissues and these, in turn, are made up of small units called cells.

The plant cell consists of:-

1. the cell wall, which surrounds
2. the protoplast.

The cell wall, which is relatively rigid, is secreted by the enclosed protoplast. The first-formed wall is called the primary wall and is made chiefly of a substance called cellulose. The walls of adjacent cells are joined together by the middle lamella which is mainly pectic substances. As the cell gets older a secondary wall may be laid down on the inside of the primary wall. The secondary wall may be many-layered and frequently becomes many times as thick as the primary wall. It is often made of cellulose or of cellulose in which various other compounds such as lignin, cutin and suberin are included. The protoplasm of adjacent cells is in contact by means of thin strands called plasmodesmata which pass from cell to cell through structures called pits. The pits are places where the secondary wall has not been laid down leaving a cavity in the wall. The cavity is normally adjacent to a similar cavity in an adjoining cell so that the pits occur in pairs.

The protoplast may be further divided into protoplasm and other substances such as crystals and starch grains. The protoplasm consists of a nucleus and cytoplasm. The nucleus is often more or less spherical and is darker in colour and denser than the surrounding cytoplasm. Part of the nuclear material includes units called chromosomes, which are constant in number for each species. Chromosomes are concerned with the control of growth and activity and will be the subject of a separate article. The cytoplasm is a clear fluid in which are various dense bodies known as plastids and mitochondria. These structures of the protoplast are chiefly concerned with cell function and will not be further considered at this stage.

TISSUES

The chief tissues of the flowering plants can be grouped into three systems.

1. Dermal tissue—This includes the primary protective layer of the

plant which is known as the epidermis, and the secondary protective layer, the periderm or bark, formed during increase in girth.

2. Vascular tissue—This contains two types of conducting tissues, the xylem (chiefly for water conduction) and the phloem (for food conduction).

3. Ground tissue—This consists of the parenchyma which may be regarded as packing tissue; collenchyma, a thick-walled supporting tissue; and sclerenchyma, a thick and hard-walled supporting tissue.

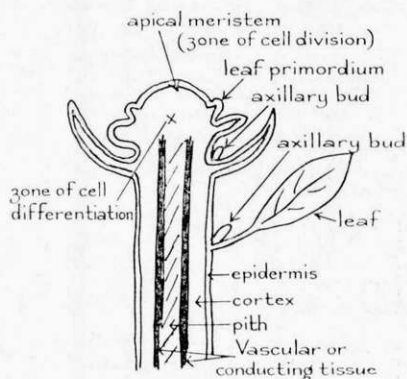


Fig. 1. Diagram of a longitudinal section through a shoot apex.

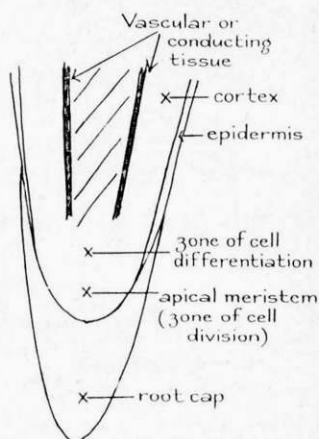


Fig. 2. Diagram of a longitudinal section through a root apex.

ORIGIN OF THE TISSUES

A flowering plant usually produces new cells and forms new organs throughout its life. Except in the very early stages of development, new cells only arise in certain parts of the plant body. These special areas in which new cells are produced are called meristems. There is a meristem at the apex of each shoot and root and these are known as apical meristems. Cells produced in these differentiate behind the meristem into the typical cell-types of the various tissues which make up the stem and root. Not all apical meristems are active all the time and dormant meristems are found, for example, in the apices of axillary buds. Increase in girth of plants, often referred to as secondary growth, is due to a meristematic tissue called the vascular cambium. Both the vascular and cork cambia form a cylinder inside the stems and roots in which they occur and their activities will be dealt with in a later article.

At the shoot apex the meristem is a dome-shaped mass of rapidly dividing cells. At the side of the dome are small bumps which eventually will become leaves and are known as leaf primordia. Behind the meristem some of the cells differentiate to form the epidermis, others differentiate into conducting tissue (phloem and xylem) and others form the cells of the cortex (See Fig. 1).

At the root apex the meristematic tissue is protected by a root cap. Behind the mass of meristematic cells there is once again a zone of differentiation where the cells of the epidermis conducting tissue and cortex appear. (See Fig. 2).

F. C. PAYNE

WILDFLOWER GARDEN

Addison Ave., Athelstone, S.A.

Manager: H. R. Holliday

Telephone: 371825

AUSTRALIAN AND SOUTH AFRICAN PLANTS

See mature specimens of plants you buy.

Open Every Day

No Mail Orders

DARGAN HILL NURSERY

18-24 Alimar Rd. Glen Waverley, Vic.

OVER 600 SPECIES GROWN

Most Available Now in Plastic Pots.

CATALOGUE GUIDE 3/- POSTED

ALL EASTERN STATES SUPPLIED

Telephone 560-8145

(Nursery Closed Sunday and Monday)

Greenbriar Drive-in Nursery

AUSTRALIAN NATIVE PLANTS

Large and Varied Selection.

BRITNELLS RD., BRIAR HILL, VIC.

1/2 mile beyond Greensborough

Phone 43-1468. Open Weekends

PRESERVATION BY CULTIVATION

FLORALANDS

KARIONG, via GOSFORD, N.S.W.

A large variety of the most popular native plants at nursery

PHONE: Gosford 21142

P. J. PARRY

AMAROO NURSERY — UU 7342

86 Lang St., Padstow, N.S.W.

160 varieties of native plants. Many displayed in a garden setting.

Eucalyptus, Banksia, Dryandra, Hakea, Acacia, Hibiscus, Leschenaultia, Paws.

Send stamped envelope for list.

AUSTRALIAN NATIVE PLANTS

3,000 varieties

Grown in the Open — Plants dispatched to all States

Catalogue and Planting Guide 4/-

Boddy's Eastern Park Nursery

32 Denman St., Geelong, Victoria

Tel.: 2598

WILLUNGA NURSERY

Native Trees and Shrubs

21 NELSON ST., THORNLEIGH

Closed most Saturdays

PHONE 84-3709

DENOVAN'S NURSERY

Good Range of Native Plants available at Nursery

188 Marco Avenue, Panania, N.S.W.

Specialists in plants for clay areas.

G. A. & K. M. ECHBERG'S NURSERY

Lower Dandenong Road

Braeside. Tele.: 91-9438

1/2 mile west of Springvale Road

WYALANDRA NURSERY

47 JACANA GROVE, HEATHCOTE, N.S.W.

Wildflowers of the Heathcote area

In stock: Species of Boronia and Eriostemon

THE HOME OF UNUSUAL PLANTS

NATIVE AND EXOTIC

King's Park and Botanic Garden, Perth, W.A.

1964 Seed List now published

(844 species listed) 1/6 post free

Seed — 3/- per packet

Wholesale rates on application.

NINDETHANA NATIVE PLANT SEEDS

By Packet, Ounce or Pound

Large selection. Send for free list.

NINDETHANA

(G. W. Althofer)

Box 5, Drippingstone, N.S.W.

★ SUPPORT THE NURSERYMEN

WHO SUPPORT YOUR

JOURNAL

YOUR GUIDE TO NATIVE PLANT NURSERYMEN

Althofer, G. W.—Nindethana Nursery, Box 5, Dripstone, N.S.W. Very wide range.
Amaroo Nursery—60 Lang Street, Padsow, N.S.W. One of the widest ranges of natives.
Belora Nursery—Box 12, Hall's Gap, Vic. W. and R. I. Stanton. The home of the *Thryptomene*.
Boddy's Eastern Park Nursery—32 Denman St., Geelong, Victoria. 3,000 varieties.
Clearview Nursery—W. Cane, Box 19 Maffra, Victoria. Specialist in developed plants.
Dargan Hill Nursery—18-24 Alimar Road, Glen Waverley, Victoria. Native trees and shrubs.
Denovan's Nursery—183 Marco Ave., Panania, Sydney, N.S.W. At nursery only.
Echberg's, G. A. & K. M., Nursery—Braeside, Highett & Moorabbin, Victoria.
Greenbriar Drive-in Nursery—55 Britnells Rd., Briar Hill, Victoria. Large & varied selection.
McLeod, F. C. J.—Warrien Rd., Croydon, Victoria—Quality Plants.
Narrabeen Nursery—1444 Pittwater Rd., Narrabeen Nth., N.S.W. Plants for coast.
Parry, P. J.—"Floralands", Kariong via Gosford, N.S.W. A wide range. Postal orders taken.
Tinderbox Nursery—Tinderbox Blackman Bay, Tasmania.
Tullamarine Plant Farm—8 Sharp's Road, Tullamarine Vic.—Open weekends.
Willunga Nursery—21 Nelson Street, Thornleigh, N.S.W. From 2/6. Mail orders accepted.
Wyalandra Nursery—47 Jacana Grove, Heathcote, N.S.W. Wildflowers of Heathcote area.

BELBRA NURSERY

In the Heart of the Grampians
 LARGE RANGE OF
 AUSTRALIAN NATIVES
 Inquiries: Box 12, HALL'S GAP

NARRABEEN NURSERY 74 AUSTRALIAN NATIVES

1444 Pittwater Rd., Narrabeen
 Nth., N.S.W. — XX 2604
 OPEN EVERY DAY
 Specialist in plants for sea coast.

NATIVE PLANTS — USUAL & UNUSUAL

F. C. J. McLEOD
 Wildflower Nursery
 WARRIEN ROAD, CROYDON, VIC.

TULLAMARINE PLANT FARM

8 Sharps Road, Tullamarine
 Phone: 30-7893
 1 mile north of Melbourne Airport
 Open Weekends, Closed Mondays
 — SHRUBS, TREES, PERENNIALS —
 Native & exotic, popular & rare

More than 300 Species . . .

Native and exotic trees and shrubs
 available from Forestry Commission
 nurseries at Pennant Hills, Dubbo,
 Forbes, and Narrandera, N.S.W.

For free catalogue giving complete details and prices
 of species contact:

FORESTRY COMMISSION OF N.S.W.

44 Margaret Street, Sydney. Telephone: B 0236

Bottle Brush Flowering Plants

The front cover illustrates *Melaleuca steedmanii* with its beautiful bottle brush type flowerheads. Our last issue describes many bottle brush flowered plants for the garden with distinguishing features between the closely related generic groups of plants. Further details that missed inclusion in that issue are given below.

NOTES BY E. WITTEW OF PERTH, WEST AUSTRALIA

Propagation—It is very little trouble to get good seed from *Melaleuca* bushes. If the larger seed capsules found back down on the branches (not the newer ones still forming) are collected and placed in a bag or bottle in the sun for a few days, the very fine seed, as fine as dust, will spill out. Sprinkle the seed lightly over a drained container of good friable soil and then mulch lightly. Sowings can be made in autumn and spring, but winter pricking out seems to be more successful. Prick the seedlings into single pots when they are about $\frac{1}{2}$ inch high.

Variety of Foliage and Habit—Other writers have mentioned the range of colours of these adaptable plants but the variety of leaf form and shrub formation is worthy of special mention as value in landscaping:—

Melaleuca violaceae: a flat spreading shrub growing at Ravensthorpe and Ongerup. Purplish flowers.

M. micromera: very erect, almost conifer-like. The foliage of tiny leaves is a mossy green and the flowers are yellow. It grows at Mt. Barker and Kendenup.

M. incana: a grey usually weeping foliage. It grows at Cannington and Busselton and is very adaptable in cultivation.

M. uncinata: a form in South Australia, is widely grown for brush fences.

M. nesophila: its large leaves (for a *Melaleuca*) and mauve flowers make an attractive bush to 8ft.

M. elliptica: the small leaves with almost a pinkish colouring blend with red flowers.

M. diosmifolia: a very attractive green foliage.

Others grown for foliage or form were *M. megacephala*, *M. cardiophylla*, *M. nematophylla*, *M. armillaris* and *M. conothamnoides*.

NOTES BY F. LULLFITZ OF WEST AUSTRALIA

Melaleuca range in size from tiny shrubs, for example a form of *M. scabra* is sometimes 6-9 inches high, to huge trees such as *M. leucadendron* growing as large as a jarrah. Fortunately for gardeners, the large trees usually have white flowers while the small shrubs suitable for gardens are often brightly coloured.

As Mr. Debenham has done in his series of articles, the many hundreds of species may be grouped as two flowering forms, those with terminal or capitate flowering, which he has yet to describe in the second section of the series and those with lateral flowering usually in the form of a bottle brush.

The best garden species of the first, capitate group are: *M. cordata*, 8 ft. shrub with pink pom pom flowers; *M. nematophylla*, 8ft. shrub with red flowers fading to pink; *M. nesophila*, 8ft. shrub with mauve flowers. A good



Melaleuca polycephala



Eremaea beaufortioides

Photographs by Ron Hill reproduced from "Growing Australian Plants" by courtesy of Rigby Ltd., Adelaide. See book review on page 36.

An issue on the pom-pom flowered *Melaleuca* and similarly flowered plants such as *Eremaea* is being prepared. Please send notes and coloured slides.

pruning each year results in a good display of flowers. Pruning produced many new shoots each of which bore flowers.

Of the second group with lateral flowers recommended plants were: *M. lateritia* ("Robin Red Breast" bush) red brush flowers; *M. elliptica*, red flowers; *M. macronycha*, red flowers on a 4ft. open bush of quite striking appearance; *M. fulgens*, bright red flowers; *M. steedmanii*, a bush to 4 feet with red flowers.

THE SOCIETY FOR GROWING AUSTRALIAN PLANTS

"AUSTRALIAN PLANTS" IS AUSTRALIA'S NATIONAL PRESERVATION JOURNAL

(A non-profit making venture, produced quarterly, dedicated to preservation by cultivation.)

This journal is published by The Publishing Section on behalf of The Society for Growing Australian Plants and its member Societies as follows:

SOCIETY FOR GROWING AUSTRALIAN PLANTS—N.S.W. REGION:

President: Mr. C. M. Taylor, 142 Ernest Street, Crows Nest, N.S.W.

Secretary: Mrs. R. Bartholomew, 1431 Anzac Parade, Little Bay, N.S.W.

SOCIETY FOR GROWING AUSTRALIAN PLANTS—QLD. REGION:

President: Mr. P. Hamilton, Carnoola Street, Bardon, Brisbane.

Secretary: Mr. M. W. Hodge, 25 Barford St., Marooka, Qld.

SOUTH AUSTRALIAN SOCIETY FOR GROWING AUSTRALIAN PLANTS:

President: Mr. A. Webster, 26 Avenue Parade, Frewville, South Australia.

Secretary: Mr. E. J. Thompson, 115 Wattle Street, Fullarton, South Australia.

SOCIETY FOR GROWING AUSTRALIAN PLANTS—VICTORIA & TAS.:

President: Mr. F. Rogers, 108 Wanterna Rd., Ringwood, Victoria.

Secretary: (Sister) E. R. Bowman, 4 Homebush Cres., Hawthorn, E.3, Vic.

SOCIETY FOR GROWING AUSTRALIAN PLANTS—CANBERRA REGION:

President: Mr. G. E. Blakers, 46 Vasey Crescent, Campbell, A.C.T.

Secretary: Miss S. Rosengrave, Hotel Acton, Canberra, A.C.T.

WEST AUSTRALIAN WILDFLOWER GROWERS' SOC. INCORPORATED:

President: Mrs. J. Hamersley, Great Eastern Hwy., East Guildford, West Australia.

Secretary: Mrs. G. Oxnam, 55 Phillip Road, Nedlands, West Australia.

Membership is open to any person who wishes to grow Australian native plants.

Contact the Secretary of the Society for your State for information without obligation.

PUBLISHING SECTION FOR SOCIETIES

Publishing Committee for this issue: R. N. Dallimore, P. D. Leak.

Sec.: K. Coxhead, Dispatch: V. Hopkins, assisted by J. Birtles, N. Gane, C. Hubner, R. Greenaway, with families. Stencils: R. Bartholomew. Illustrations: A. Spurway and E. Ham.

Advertising and Sales Representatives in each State: N.S.W., P. D. Leak; Qld., W. W. Kilgour; S.A., I. G. Holliday, Tas., G. van Munster; W.A., F. Lullfitz, Vict., F. R. Jeffs.

MAIL—Address mail to the Editor, 860 Henry Lawson Drive, Picnic Point, N.S.W.

SUBSCRIPTION—Members: Apply state Secretary above.

NON-MEMBERS: You may receive the next 4 issues direct to your home by forwarding an annual subscription of 12/-. Overseas subscriptions are 12/- sterling or 1½ dollars.

YOUR GUIDE TO NATIVE PLANT SEEDSMEN*Nindethana*, Box 5, Dripstone, N.S.W. For all Native Seed. Packets, ounce or pound lots.

Free list on application. Special supplies of West Australian Seed.

Australian Seed Co., Robertson, N.S.W. Bulk or packet lots. Stamped envelope brings lists.*Western Wildlife Suppl.*, Gilgandra, N.S.W.—Bulk supplies of natives and exotic tree and shrub seed to the trade—Special collections to order.*King's Park Seed Supply*, King's Park, Perth, Western Australia—Seed list 1/6 post free, seed 3/- pkt.*Thinking of . . .***TYPEWRITERS, ADDING MACHINES, OFFICE EQUIPMENT,
STATIONERY AND ALL TYPES OF COMMERCIAL PRINTING**

- You can get satisfaction and efficient service on office supplies, typewriters, office machines and office furniture when you deal from people interested in your needs.

Complete range of Namco and Olivetti Equipment.

Why not ask for a price list on these items.

Delivery anywhere in the Metropolitan area.

Surrey Beatty & Sons**RICKARD ROAD, CHIPPING NORTON**

(at Milperra Bridge)

602-6522, 602-7404



THE FLAME CONE GREVILLEA

by A. S. George

There are apparently only three *Grevillea* species with this type of inflorescence. These are *G. eriostachya* Lindl., *G. excelsior*, Diels, and *G. pteridifolia*, Knight. The two former species have identical flower and leaf structure and only seem to differ in their habit of growth; hence the difficulty in identifying a single flowering branch. *G. eriostachya* is a shrub up to 2-3 metres with several spreading stems and the flowers borne on long branches which are generally sparsely-leaved. *G. excelsior* is a more upright shrub or small tree of pine-like growth, up to 5 metres in height, and usually with only a single main trunk. The branches are spreading and generally leafy right up to the flowering spike. The flowers are often a much deeper orange in *G. excelsior* but this is not always so.

In South-Western Australia both species grow on sandplain but rarely, if ever, together. However, while *G. excelsior* is confined to an area extending from the Murchison River southwards to Lake King and eastwards almost to the Goldfields, *G. eriostachya* extends from a similar area northwards to Onslow and eastwards throughout the deserts of Central Australia.

Grevillea pteridifolia is a tree of tropical Australia. It grows to 8 metres, having a single trunk and spreading-erect branches giving the upper part a much more rounded appearance than the two previous species. Also the leaves are coarser and flatter, and the flowering spikes slightly less dense, though the floral structure is very similar. The flowers are bright orange.

Several other species of *Grevilleas* are closely related to these three, but have somewhat differently arranged flowers.

From D. N. Gordon

Grevillea excelsior and *G. eriostachya* are both susceptible to wet feet and require perfectly drained deep sandy gravelly soils. *Grevillea pteridifolia* on the other hand will tolerate much wetter conditions and also high humidity. The form known to me from Central Inland Queensland (Alpha area) has not the habit mentioned by Mr. George, but is a large many stemmed shrub. It is a very beautiful plant, long flowering, at times prolific. It has proved very successful in Brisbane and would do well in Sydney sheltered from cold winds.

When illustrated the flowering racemes of *G. excelsior* and *G. eriostachya* are shown standing in a vertical position. For instance they appear that way on the cover plate and also in Gardner's "Wildflowers of Western Australia." This is not their habit on the bush. The racemes of three of these species are always borne in a more or less horizontal position. There are some beautiful *Grevillea* that do shoot up a long stem topped by a conical spike and we should have an article on these fine plants in the future.

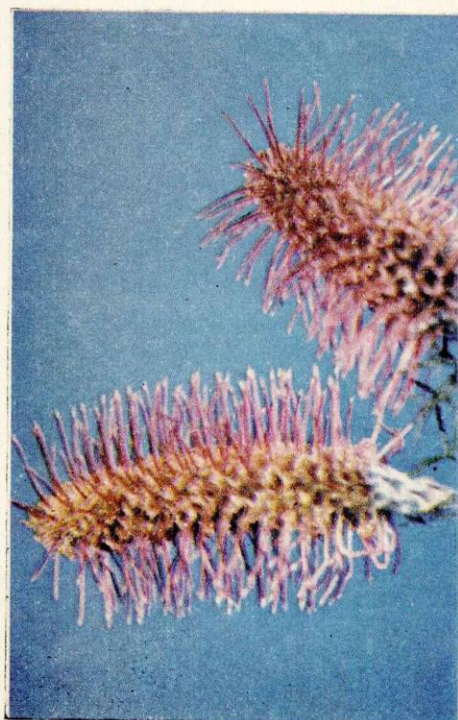
For growers wishing to cultivate any one of these three, *Grevillea pteridifolia* would be the most easily handled. It is drought hardy, tolerant of wet feet and high humidity and fairly frost hardy. Also it is very prolific and will reach maturity in one year. It is smaller and more compact than the others (my form) with beautiful foliage and flowers that are borne almost throughout the year. In my opinion it would excel the W.A. species in Perth under garden conditions.

GREVILLEA FROM CENTRAL AUSTRALIA — A note by G. Chippendale

The species of *Grevillea* in Central Australia are *Grevillea eriostachya*, *G. juncea*, *G. refracta*, *G. stenobotrya*, *G. striata* and *G. wickhamii*. Although they would all be highly decorative in gardens, I have not seen any being so used.

Grevillea petrophilodes

Grevillea patentiloba—Photo P. Althofer



Grevillea paradoxa
Photographs by J. Glass Geraldton

Grevillea tenuiloba