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Photography by F. W. Humphreys

GREVILLEA HOOKERIANA

One of the "tooth-brush" flowered Grevillea described in this issue.

WILDFLOWERS DESCRIBED FOR CULTIVATION IN THE GARDEN INCLUDE
GREVILLEA, ANDERSONIA, LEPTOSPERMUM, HYPOCALYMMMA
TREES FOR ORNAMENTAL PURPOSES—THE FIREWHEEL TREE AND CONIFERS
IDEAL FOR POT, DWARF OR SPECIMEN FEATURES
ORCHIDS—TERRESTRIAL ORCHIDS WITH DETAILS OF CULTIVATION INCLUDE
GREENHOODS, BEARDED ORCHIDS, LYPERANTHUS

CONTENTS OF THIS ISSUE

Each issue is a complete book in itself on Australian wildflowers, covering some aspect of their cultivation and preservation. This issue is the final one in Volume No. 4 and presents:

WILDFLOWERS—SHRUBS FOR THE GARDEN

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 "*Andersonia*—The Family Epacridaceae in W.A." by Ken Newbey—page 340—Attractive species described.

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—"Winter Flowering *Pterostylis*" by Peter Uhlherr—page 348.

"Orchids—How to Grow" by R. C. Nash—page 356. The articles above give cultivation details also.

GROWING WILDFLOWERS

Articles indexed above give details of propagation and cultivation the plants described. As this is the principle objective of this publication, further details on general cultivation are:

"A Natural Pond for Your Garden" by L. K. Bates—page 367.

"The Case of Gardeners v. Slaters" by W. M. Martin—page 372.

WILDFLOWER EXHIBITION AT KING'S PARK, PERTH, W.A.

This exceptional display of Western Australian wildflowers is to be staged Thursday, 3rd October, 1968. One feature of the display will be a special presentation of a specimen flowerhead from a very large range of Grevillea species.

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 AUSTRALIAN PLANTS — PAST ISSUES

Volume No. 1 (bound) issues 1-12, has now sold out. Except for issues 2 & 3 the remaining 10 issues are available at 40 cents each + 5c postage or \$4.00 + 20c postage for the Vol. 1 set. Supplies of Volume No. 2 (issues 13-20) at \$6.00 + 20c postage are still available, many of the issues being no longer available singly. Volume No. 3 (issues 21-28) is now available fully bound at \$6.00 + 20c postage. Issues prior to this issue and later than No. 29 are available singly at 40c + 5c postage. For overseas, postage x3.

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TOOTHBRUSH GREVILLEAS

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

The "Toothbrush" Grevilleas of N.S.W. are a small group occurring in the eastern part of the state, and chiefly in the Blue Mountains. Two exceptions are *Grevillea caleyi*, which is found in the Kuring-gai Chase and around Terrey Hills; and *Grevillea barklyana*, from Jervis Bay locality, southwards along the coast.

The common name "Toothbrush" is very apt, referring to the one-sided arrangement of a group of individual flowers. The six species described below are all fairly well known, and, generally speaking, have responded well to garden conditions. The adaptability of some of these species is remarkably shown when one is known to flourish in a Victorian Mallee home garden—a strange transition from its Blue Mountains origin.

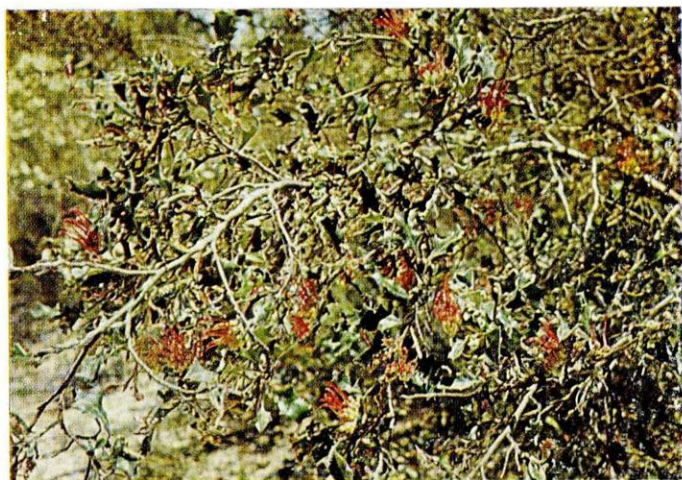
Grevillea longifolia is probably the best known of the group, although the name may be unfamiliar. *Grevillea longifolia* was formerly known as *Grevillea aspleniifolia*, while the species now known to botanists as *Grevillea aspleniifolia* was previously called *G. aspleniifolia* variety *shepherdii*. We should not be too hasty in blaming botanists for confusion in changing names of plants. They have to follow internationally accepted laws of nomenclature. In the early days of this country indiscriminate collecting of botanical material was quite common, as a consequence, a good deal of scientific description of this material was buried away in obscure publications in various parts of Europe. It is the discovery of these documents from time to time that causes minor botanical upsets, and not, as is sometimes thought the propensity of botanists for changing names.

The characteristics which may help identify these two related species are as follows: *G. longifolia* is usually found near streams. The serrations of the leaves are a constant feature, but they are not usually cut as far as the mid-rib. A microscopic examination of the hairs beneath the leaves will show that they are straight and not curling. It is recorded from the lower Blue Mountains, George's River area to Cataract Dam region. This is a hardy shrub in cultivation, but, like so many other "natives" it becomes scraggy with age. It can stand hard pruning however, and this will give it a fresh appearance. The foliage has a pleasing fresh-green look about it, and the Toothbrush flowers are reddish.

Grevillea aspleniifolia is usually found on slopes or ridges. The leaves are very narrow, perhaps a quarter of an inch in width and sometimes nearly a foot in length. Some leaves are without any serration at all, while others have but a single cleft. Specimens from different areas vary quite a lot. A shrub, or small tree, from Mittagong, for instance, has finely-toothed, very narrow leaves. A microscopic examination of hairs beneath leaves of this species will show them to be curling, unlike the other species.

Grevillea aspleniifolia, with the long narrow leaves, is recorded from Cox's River, Nattai River, and Yerranderie. It is usually found on slopes or ridges. This shrub, or small tree, is seldom seen in cultivation. The one that we have growing here in Pymble, came from nurseryman George Althofer, several years ago. It successfully survived transplanting when it was five feet high, and is now growing to about eight feet, in a sheltered position,

though open to the north. It flowers for most of the year, and the very deep mauve compact flowers resemble a toothbrush more than any of the other species mentioned. It is a favourite with the honeyeaters (noisy miners and wattle birds), and the quivering branches testify to this especially in the early morning. Seedlings germinate readily beneath this shrub and they show a wide range of variation in leaf form, from the narrow, entire (unserrated) to the typical toothed form of *Grevillea longifolia*. This may be the result of cross pollination between the parent and *G. longifolia*, as specimens of the latter are growing in a neighbour's garden. On the other hand it may be the sign of an hereditary link between these obviously related species. A microscopic examination of the undersides of the leaves of these seedlings may decide which is the heir apparent!



Photography and block donated by N. B. Thomson.

HOLLY GREVILLEA—*Grevillea aquifolium*

Grevillea acanthifolia is found from near Lidsdale to the Woodford district. It favours the damper situations. It has deeply divided leaves that are rather prickly, and flowers that are of a deep mauve, or pinkish colour. This is a beautiful shrub, and an accommodating one too, as it is recorded growing happily in a garden in the Victorian Mallee country. *Grevillea acanthifolia* is generally an upright shrub growing to about four feet or more in height.

Grevillea barklyana is recorded from Jervis Bay, Milton, Ulladulla, and southwards. The form now known among growers as the Jervis Bay form is an upright one, but, like so many other *Grevilleas*, prostrate forms are known as well. This should be a shrub for the seaside, with its entire, leathery leaves. These leaves are more like the traditional "Gum leaves" than those usually associated with the *Grevillea* genus. Flower colour ranges from a deep red to a greyish-pink. It is a sturdy shrub, and plenty of room should be left for it to develop in a garden. As seeds germinate freely beneath this shrub in the garden, its future should be secure. This species may not be as colourful as some already mentioned, but if the prospective grower can get one of the deep pink coloured forms, he would be well advised to do so.

GREVILLEAS I KNOW WITH TOOTHBRUSH FLOWERS

by Bill Molyneux, Vermont, Victoria

I have written this article as a keen layman who with his wife and children has studied this fascinating genus in its natural habitat throughout Victoria, and will be presenting this article for the home gardener as I have no great botanical knowledge.

The term "Toothbrush" referring to the arrangement of the flower heads or the inflorescence is one that is commonly used and readily understood by the amateur botanist and naturalist alike. On writing of this group I will confine myself to Victorian species, but will exclude some which, though known to exist, are still awaiting classification.



Photography by W. H. Payne

Grevillea acanthifolia

"Holly-leaved" *Grevillea*

The first and largest group, using another non-botanical term, is the "Holly-leaf" section, this group accounting for six of our named species with several varieties of some species. These are all the "Holly-leaf" species of *Grevillea* at present recognised for Victoria.

Grevillea dryaphylla occurs in the Bendigo area, also at Maryborough, both being very dry auriferous localities. This is a shrub with varying habit, sometimes procumbent and at other times upright to 4 ft., with a rather untidy habit. Leaves are small and deeply lobed appearing grey. The short raceme usually no longer than 1½ in., varies through yellow, pink and red. These variations in colour being often in close proximity to one another. It is a plant which when grown under garden conditions in chocolate soil develops its foliage to more than twice its natural size, the flower also improves by comparison. An immediate association which is often mentioned is *G. alpina*, small grey mounds of foliage showing white, yellow, red and green flowers on neighbouring bushes.

Grevillea repens has two occurrences. The form on Mt. Slide, 30 miles N.E. of Melbourne is completely prostrate with oval undulating prickly leaves attaining a spread of 4-5 ft., and has attractive though subdued maroon flowers. The other form is found south of Daylesford some 70 miles west and is a much more vigorous plant, still prostrate, but with leaves much larger and the new tips show an attractive bronze. A feature of this plant is that it has a greater variety of colour than the Mt. Slide form, orange, pink and red, with two colours often occurring on the one shrub. The spread of this shrub has been measured at more than 10 ft. On a recent trip to the area which has had no apparent rainfall for some time, we noted that quite a few of the plants had dark red foliage not unlike the autumn tints of some imported exotics. It added to the beauty of the plant outside its normal flowering period.

Grevillea ilicifolia probably is the most variable in foliage. It occurs in the Grampians and Mt. Arapiles areas and extends through the Little Desert north to Wyperfeld National Park. There is also an early recorded finding in the red sand belt area of Sandringham, a southern Melbourne bayside suburb, which possibly no longer exists due to the extensive settlement which has taken place in this area. This species starts as an open shrub to 6', the leaves being lobed and divided with prickly margins, the underside being silkily appressed with prominent veining. The flower is usually red but some variations occur with yellow. *G. ilicifolia* var. *lobata* which I have only found growing in the Quantong cemetery near Vectis is usually prostrate, leaves kite shaped and more often singly lobed a third of the way down from the apex. This is the only remnant in an area of what must once have been an extensive natural bush area, but is now for many miles around the cemetery, flat cleared farm land. Going ten miles N.W. from Natimuk into the bottom end of the Little Desert, a restricted occurrence of *G. ilicifolia* var. *angustiloba* grows as a prostrate undershrub. The leaves to 3" are irregularly forked with lobes no more than 1 mm. wide, the appearance being that of a leaf which has been attacked by a pest, with only the veins remaining. An exceptional rockery or ground cover plant. A similar form which may prove to be the same, grows west of Keith in South Australia.

Grevillea aquifolium is a variable relative of *G. ilicifolia* ranging from Stawell through the Grampians to the southern end of the Little Desert. Usually an upright spreading shrub to 5', the oval leaves have shallow pungent lobes. Flowers are bright red and in profusion. A form from Mt. William and Mirranatwa Gap in the Grampians is a more procumbent shrub the leaves being longer, narrower and more deeply lobed. An exceptional foliage plant.

LARGE GREVILLEA SHRUBS

SPECIES GROWN IN HEAVY SOIL IN MELBOURNE, VIC. by John Howard

Grevillea caleyi. A big hardy plant if drainage is good. It needs a warm sunny position preferably against a north-facing fence to make vigorous growth; otherwise, plant is spindly and stunted. The soft furry leaves, fern-shaped, and with pink tips, and abundant red "tooth-brush" flowers in spring and summer make this species a splendid garden subject. Although it will grow unevenly seeking the sun if not pruned, it can be trained to grow along a fence.

Grevillea hookeriana. The light green spiny fern like leaves which are very unusual and decorative make this a good specimen subject even when not in flower. Flowering begins in spring and if well cropped the bush will flower well into summer. It is quite hardy and strong growing when sited in a sunny well drained position.

Grevillea banksii. A very long flowering showy plant that is widely grown in Qld. and N.S.W. Sickly looking plants are often seen around Melbourne with yellowish leaves and stunted growth. Poor drainage appears to be a major factor in this and also probably, lack of summer watering with insufficient warmth.

Grevillea miqueliana. A large attractive spreading bush with large broad, furry, pale green leaves and pink-orange flowers. The plant is hardy and fast growing needing little attention.

Grevillea linearis. A large tall growing bush with mauve flowers carried nearly all the year. Flowers are strongly scented of nectar, attracting many bees. Hardy and not fussy as to growing conditions.

Grevillea nematophylla. Very long thin terete leaves give this species an unusual appearance. It is exceptionally hardy and can go for long periods without water. As with the other species it needs a warm, sunny position. It is rather slow growing at first, especially if the soil is heavy. After being planted for nearly 6 years a plant in very favourable conditions has reached 7 feet in height and has flowered for the first time. The white flowers are quite ornamental with a cloying scent. This species can take any amount of watering but can also withstand very dry conditions.

Grevillea bipinnatifida. My plant is five years old but a little straggly. However it is a very good flowerer, bearing nearly all the year. I have been advised that heavy pruning is beneficial.

GREVILLEA GEMS FROM W.A.

An article by F. Lullfitz and E. Wittwer in our No. 29 issue described many very desirable species of *Grevillea*. Because of space limitations this species was left out. Many other species of *Grevillea* were described in that issue by various authors.

Grevillea yorkrakinensis

A low growing, rigid and divaricate stemmed shrub about 6" high and 2 ft. in diameter on yellow sand in 13" rainfall. Leaves are light green, flexible, slightly pungent, almost terete, finely grooved and terminating in a fine point, 1/32" in diameter, 3/8" to 3/4" long and fairly close together. Flowers are reddish, with long styles, narrow, 3/4" long, axillary in 1's or 2's and fairly plentiful. Flowers August-September.

An attractive low species in flower and foliage for well drained, exposed or sheltered positions.

EPACRIS—HEATH FAMILY

THE FAMILY EPACRIDACEAE IN THE ONGERUP AREA by Ken Newbey

This family is represented by 15 genera in W.A. and the majority of these are to be found in the Ongerup area. They are found growing mainly as low shrubs or undershrubs up to 2 ft. in height on sands or rocky soils. A few species tend to dominate small areas but most have scattered distribution.



Photography by F. W. Humphreys

Andersonia parvifolia

Andersonia parvifolia: A loose or dense, much branched shrub to 12" usually found growing in shallow soil overlying flat granite rocks but sometimes on sand in 15" rainfall. Leaves are similar to *A. lehmanniana* spp. *pubescens* but only 1/16" long and very light green in colour. Flowers are narrow, up to 3/8" long, deep pink in colour, from 5 to 15 in open terminal heads which are about 5/8" in length. The bush is almost entirely covered with flowers when in full bloom. Flowers Sept. to Dec.

ANDERSONIA

An attractive group of plants with their corollas surrounded by coloured sepals. The leaves of all species of this genus sheath the stems.



Photography by F. W. Humphreys

Andersonia echinocephala

***Andersonia echinocephala*:** Grows as an open, upright, rigid stemmed shrub to 4 ft. on sand or clay in 20" rainfall. Leaves are narrow triangular, up to $1\frac{1}{2}$ " in length and $\frac{1}{4}$ " at the base, more or less alternate, in the lower part sheathing the stem and then becoming more or less upright, fairly rigid and light green in colour. Leaves on branchlets are smaller, up to $\frac{5}{8}$ " in length and recurved. Flowers are light yellow, about $\frac{3}{8}$ " long, sessile, singular, about $\frac{2}{3}$ obscured within the leaves forming leafy terminal heads. Flowers Sept. to Dec.

An unusual and attractive species for either shade or exposed conditions.

Further species are described on page 363

ANDERSONIA R.Br.

Betsy R. Jackes (Townsville University College)

(Abridged from a "Taxonomic Revision of the Genus *Andersonia* R.Br.
L. Watson, 1962)

This genus is confined to Western Australia. Although twenty-two species are recognised, the majority are confined to very small areas, e.g. *Andersonia sprengelioides* which is common within a radius of thirty miles from Albany, outside this limit only a few plants are found. *A. parvifolia* and *A. caerulea* are the two most widely distributed species. Although an open habitat seems to be preferred, Watson states "that some occur as sub-shrubs in swamp-heath associations, others in dry sandplain regions, and a few form compact cushions in exposed rocky places or near the sea".

Within a species there may be considerable morphological variation, which is related to environmental differences. The flowers are frequently brightly coloured and conspicuous, the sepals in particular show considerable variation in colour, whether it be white, scarlet, blue or one of the intermediate shades depends on the species in question. It has been suggested that colour may be linked with habitat preferences.

The corolla is more or less pubescent inside, the degree often being characteristic of the species. The stamens are free from the corolla-tube. In all species a hypogynous disc surrounds the ovary.

KEY TO THE SPECIES

(Modified after Watson, also Blackall and Griseb.)

Flowers terminating lateral shoots, each flower surrounded by numerous bracts ... SECTION 1
Flowers grouped into terminal heads, each flower almost sessile in the axil of a bract and enclosed between two keeled bracteoles ... SECTION 2

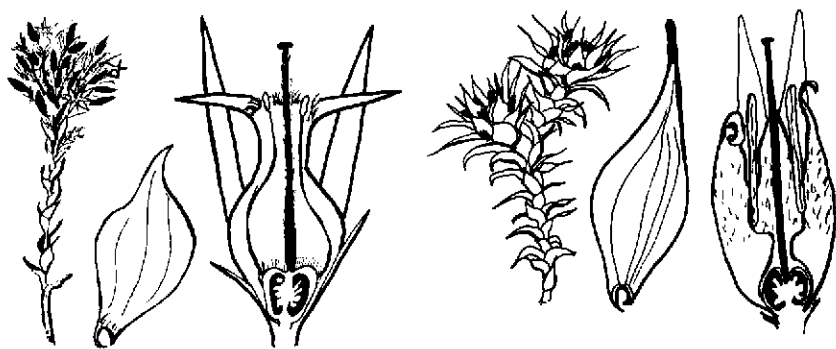
SECTION 1 — MULTIBRACTEATAE

- Leaves twisted, often undulate and grooved, often exceeding 7 mm. in length; flowers more than 5 mm. long B
Leaves not twisted, not undulate, usually not grooved, 1-6 mm. long, tips triquetrous, appressed or incurved; flowers 3-7 mm. long D
B. Staminal filaments and style glabrous 1. *A. barbata*
Staminal filaments and style pubescent C
C. Staminal filaments bear a pair of tufted ear-shaped lobes below the middle; flowers 10-27 mm. long 2. *A. auriculata*
Staminal filaments linear or somewhat broadened above the middle; flowers 5-12 mm. long 3. *A. caerulea*
D. Filaments pubescent or with tufts of hair F
Filaments glabrous F
E. Stigma capitate; anthers oblong or linear-oblong, about half as long as the filaments, attached near the centre 3. *A. caerulea*
Stigma truncate-clavate; anthers linear about as long as the filaments, basally attached 4. *A. macranthera*
F. Stigma capitate; leaves spreading or erect; corolla-tube often pubescent externally 5. *A. heterophylla*
Stigma truncate or slightly clavate; leaves appressed or incurved; corolla-tube glabrous externally G
G. Style thickened below middle, tapered at base, rough; corolla-lobes ± pubescent below middle, not bearded 6. *A. micrantha*
Style subcylindrical; corolla bearded in the throat, corolla-lobes glabrous 7. *A. brevifolia*

SECTION 2 — BIBRACTEATAE

- A. Leaves often exceed 2.5 cm., lanceolate, bracts much longer than flowers; corolla-lobes glabrous, acuminate, longer than corolla-tube B
Leaves less than 2 cm., sometimes lanceolate; bracts often shorter than flowers; corolla-lobes not acuminate and not contracted above ovary C
B. Bracts lanceolate; anthers much longer than flattened filaments 8. *A. arilliflora*
Bracts deltoid with acuminate tips, anthers about equal to or shorter than the slightly flattened filaments 9. *A. echinocephala*
C. Corolla softly hairy inside; corolla-lobes longer than calyx; sepals acuminate; leaves small 10. *A. setifolia*
Corolla pubescent or bearded; corolla-lobes shorter than calyx (except in *A. aristata*); sepals not acuminate D

- D. Leaves not twisted or undulate, tips rigid somewhat triquetrous, rarely exceeding 8 mm. long E
 Leaves $\pm$ spirally twisted, $\pm$ undulate, tips spreading, incurved or recurved, usually exceeding 8 mm. long J
- E. Calyx $\pm$ 7-12 mm. long; corolla-lobes densely bearded over the lower $\frac{1}{2}$ inside F
 Calyx $\pm$ 2-6 mm. long; corolla-lobes glabrous or bearded below the middle inside G
- F. Corolla, style and stamens longer than calyx in older flowers 11. *A. aristata*
 Corolla, style and stamens shorter than calyx 12. *A. gracilis*
- G. Inflorescences spike-like or ovoid with $\pm$ 20 flowers, each terminated by a single multibracteate flower; leaves 2-8 mm. long 13. *A. simplex*
 Inflorescences bunched, usually less than 20 flowers, terminated by the withered shoot apex (except in *A. carinata*); leaves 1-5 mm. long H
- H. Anthers $\pm$ lanceolate, acutely blind at the apex, at least as long as the filaments 14. *A. bifida*
 Anthers linear-oblong, apex rounded or somewhat retuse, usually shorter than the filaments I
- I. Inflorescences terminated by the withered apical shoots 15. *A. parvifolia*
 Inflorescences terminated by a single multibracteate flower 16. *A. carinata*
- J. Calyx 10-15 mm. long; leaves often exceeding 12 mm. long K
 Calyx 2-7 mm. long; leaves rarely exceeding 12 mm. long M
- K. Anthers oblong, filaments flattened, somewhat broadened near the base, somewhat pubescent below the middle 17. *A. grandiflora*
 Anthers linear-oblong, filaments spindle-shaped densely pubescent L
- L. Corolla-lobes about as long as corolla-tube; anthers about equal in length to the filaments 18. *A. longifolia*
 Corolla-lobes about half as long as corolla-tube; anthers about half as long as filaments 19. *A. latiflora*
- M. Sepals about 7 mm. long; inflorescences bunched rarely containing more than 15 flowers N
 Sepals about 2-4 mm. long; inflorescences spike-like, ovoid or spherical, containing 20 or more flowers O
- N. Stigma clavate; corolla-lobes pubescent inside but not bearded 20. *A. sprengelioides*
 Stigma capitate; corolla-lobes bearded inside 21. *A. lehmanniana*
- O. Leaves usually recurved; inflorescences spherical, terminated by withered apical shoots; anthers linear 22. *A. involucreata*
 Leaves rarely recurved, inflorescences spicate or ovoid, terminated by a single multibracteate flower, anthers broadly ellipsoid 23. *A. simplex*



Andersonia caerulea (left)—Branch $\times \frac{1}{2}$, full size, leaf $\times 6$, flower $\times 5$.

Andersonia echinocephala (right)—Branch $\times \frac{1}{2}$, leaf $\times 3-5$, flower $\times 4$.

NOTES ON THE SPECIES

1. *Andersonia barbata* L. Watson is a newly described species closely related to *A. caerulea*. It is an erect shrub about 40 cm. high, found near King George's Sound.

2. *Andersonia auriculata* L. Watson. The characteristic feature of this species is the tufted earlike appendages borne on the lower portion of the staminal filament. An erect shrub usually less than 20 cm. high, the flowers have greenish-white sepals, and white or bluish petals. Occurs in swamps in the Nornalup-Qurram area; flowers winter-spring.

Continued on page 360

PROPAGATION AND CULTIVATION

DOUBLE WAXFLOWERS by Peter N. Ellis

Whilst double waxflowers are erratic in propagation, 1-3 inch cuttings taken in either autumn or August-September have been successful at times when set in a 3:1 sharp sand peatmoss medium, with a moist atmosphere. Occasionally they will strike in 6 weeks after setting, but usually not less than three months, and often exceeding twelve months. Transplanting should be done carefully, and tins or peat pots would be the most suitable containers for the preliminary stages of growth. Plants should be carefully hardened off to avoid the high percentage of losses experienced by many propagators.

Double waxes may grow in hot dry sunny positions once established, but under such hard conditions with a medium loam to heavier clay soil, the shrub is usually small and straggly with a poor show of flowers.

Exceedingly good results have been obtained by planting them in a raised bed of medium soil to which has been added some grovel, grit and sand, and plenty of nice decayed bush humus. They appear to like large rocks set into the soil or to retain the bed, as this probably acts as an anchor for their roots, a temperature buffer (from frost and heat) and moisture supplier. Plants definitely do better in bush loam, and after the above treatment, they grow very fast into large bushes, producing an abundance of flowers from August to October. Perfect drainage is a necessity. Heavy pruning is beneficial every few years, and a light trimming or "hair cut" more regularly after flowering. A surface mulch of bush humus is appreciated with very light applications of rabbit, sheep, or cow manure (well decayed of course). A fairly moist soil is more desirable than the hard dry conditions of the old school. I find that a thorough soaking by allowing the hose to trickle around its root system for a few hours once a fortnight quite adequate, although it could be increased to weekly doses during exceptionally hot weather. Scale is about the only pest which ever needs controlling. Spray with white oil/pyrethrum mixture is all that is needed. A dusting with sulphur discourages moulds, etc., and keeps the soil slightly acid. A pinch or two of Epsom Salts on the surface soil may help to cure any yellowing tips. If this fails, try a little iron sulphate or potassium nitrate in the same manner.

Time will tell whether the plants will live a long life, or whether they will collapse overnight as so many double-waxes have a habit of doing.

Double-waxes appear to do very well in 4-gallon drums and would probably make good tub plants, or grow even in a 10" pot if the same procedure is followed as above. They seem to like morning sun, but some partial shade during the heat of mid summer's afternoon.

ERIOSTEMON - BORONIA - PHEBALIUM

Eriostemon, the "waxflowers" have been described quite fully in our earlier issues nos. 4, 5, 6, 14 and 15. In particular methods of propagation and cultivation were very fully detailed for the benefit of the most inexperienced gardener. "The Fairy Wax-Flower". *Eriostemon verrucosus* is shown in full colour on the rear cover of this issue.

Boronia and *Phebalium* are closely related to *Eriostemon*. Apart from our no. 17 issue, very little has been presented on these very showy garden plants. Issues are now being prepared and readers are invited to forward comments on experiences.

DOUBLE WAXFLOWERS

by Peter N. Ellis

Of all the double waxflowers found, those of Longlea Junorton, Semmens' form from Mandurang-Sedgwick (both Bendigo districts) along with two forms from Heyfield, Gippsland, have been the most notable. They normally have long arching branches along which are laden large waxy white or pink blossoms with numerous petals in multiples of five, highlighted with rosy-pink sepals and plump buds. The flowers have from ten to twenty or more petals with numerous attractive orange-yellow stamens clustered in the centre, and resemble a delicate miniature water-lily. Most flowers are about an inch across but in very good years, with perfect growing conditions, they may exceed a 20c piece in size.



Photography by Peter N. Ellis

Semmens' Double Waxflower. A form of *Eriostemon verrucosus*. The pride of Bendigo is the "Semmens' Double Waxflower". Here is its history, much of which was related by Mr. Redvers J. Eddy of Bendigo.

Mr. J. Semmens, former Chief Forestry Officer, found the double waxflower on his new property at Sedgwick-Mandurang, just nine miles from Bendigo, prior to World War I. When the land was to be cleared he erected a triangular fence around the plant to protect it, and this exists there today. It is 62 years since its discovery, and the bush was old then.

As he was getting on in years, Mr. Semmens feared his double-wax might be lost forever, and so he contacted Messrs. Rimingtons, nurserymen of Melbourne, to have it propagated. At first they tried cuttings but these proved unsuccessful. As might not be realised, many *Eriostemons* regenerate by suckers and the original double-waxflower found consisted of five plants in close proximity to each other. Rimington's propagator had to resort to lifting a plant and from this plant, by means of root division, established several stock plants (1934). From cuttings or further root divisions, he gradually built up a large stock of plants for the general market by 1939. However, the plants proved difficult to establish, short-lived and so there was little demand for them. Eventually Rimington's stock plant died, and the double-wax was almost lost to cultivation.

Fortunately Mr. J. Eddy of Bendigo acquired one of the Rimington plants. Years later the Creswick Forestry Nursery near Ballarat contacted Mr. Eddy for cuttings, but they too apparently had no success. Mr. Eddy's plant had now suckered, and he had two or three plants, one of which came up outside his fence. This plant grew and flowered profusely for many years, until someone found it and dug it up. A visitor stood on a branch of the other plant, broke it off and without noticing, ground it into the earth with his heel, and by some co-incidence it struck and grew, and is still flourishing in Mr. Eddy's garden today. The other plants died, the death of which was due to a mould which was not remedied by treatment with copper sprays. The Ecology Branch of Agriculture, at the request of Mr. J. H. Willis, examined specimens from the plant to determine the cause. Microscopic examination indicated the breakdown of the oil glands resulting in discolouration of the stems and dying back. This in their opinion was caused by an excessively wet winter, poor drainage, and association with unnatural organisms in garden areas. As waxflowers occur on poor dry soils of Ordovician sediments, they should be given a site having particularly good drainage and a hot, dry, very sunny exposure, with a minimum of "codling". Copper-containing sprays could have also proved toxic to the plant.

The late Mr. H. Cahill of Arnold Ltd., Bendigo, obtained a plant of the "Semmens" double-waxflower from Mr. Swanson of Frankston about eight years ago. He built up a raised bed, retained by a sandstone rock wall, and carried in loads of bush soil to fill it in a sugar bag on the handlebars of his bicycle. He blended the bush soil with gravel, charcoal, sawdust, and a little blood and bone. Conditions were ideal, the plant facing east, received adequate water as required, drainage was perfect, and it was partially shaded from the mid-afternoon sun. It thrives there today having grown to nearly three feet in height and width, and being absolutely laden with bloom.

Mr. Cahill tried cuttings from this plant using conventional methods. He used 3 parts sharp sand blended with thoroughly soaked sawdust or peat moss for a propagating medium, and kept the cuttings under glasshouse conditions. The 1" to 3" cuttings were taken in August-September and treated with Hormomone A. About six to eight weeks later, 71 cuttings had struck, but as experienced by other propagators, he lost nearly all following trans-

plantation to pots. He had no further luck with the double-wax, although the single-wax was not difficult. He later propagated a very nice deep pink single form.

Five years ago there were three double-waxes surviving in the triangular reserve on Mr. A. Semmens' property. At that time Mr. Eddy won Photoflora with his slide of the large original plant in the middle of the plot. The other two plants were apparently suckers, but someone accidentally jumped on to one of these and killed it. Two years ago, the original plant died of old age and now only the other smaller plant survives. (For how long?)

The Semmens' family has for years picked sprays of the waxplant and displayed them at various wildflower shows. Mr. Eddy was at first worried that this might harm the plant but Mrs. Semmens assured him that the best time it ever flowered was the year after a bull broke in and chewed it down.

OTHER DOUBLE WAXES:

Of course this is not the only double waxflower found in the Bendigo district. Mr. F. Taylor of Harcourt, has records of two different plants found at Mandurang South about 1925, one at South Lockwood in 1930, one at Barker's Creek near Castlemaine in 1934, as well as his eleven plant colony of Longlea-Junorton from 1918-1955. This form was even more attractive than the Semmens' form, the flowers being equally as large and profuse, and having a flush of shell pink. Mr. Taylor's mother remembered one on McIvor Hill in 1870. Mr. Eddy found one similar to Semmens' form in Mandurang West about 1955. Most of these reported plants are carefully guarded secrets, and often have been lost with the death of the finder concerned. If only those people concerned would forward cuttings and sprays to the S.G.A.P. for record, and for propagation, thereby enabling us to establish each plant in our wildflower reserves. I have not recorded here all the reports we have received to date. We respect the finder's desire to keep these plants' locations secret.

Mr. W. Cane of Maffra, reports several good forms from the Heyfield district, Gippsland. One is a white formal double with flowers 1" in dia. 'Formal' is used in the strict horticultural sense, meaning many rows of fully imbricated petals becoming smaller towards the centre, and with a complete absence of stamens. Ten years ago, Mr. Cane found a double waxflower which greatly resembles the "Semmens" form, and is perhaps slightly superior, having a faint flush of shell pink on the petal tips. These plants are available from Mr. Cane as "Heyfield Double Waxflower" and "Clearview Double".

Mrs. McAllister of Box Hill, Melbourne, has many plants of both Semmens and Heyfield form growing side by side, and confirms the experience of many other competent observers that both are very similar. Is it possible that soil, conditions, and area affects the colour slightly as if the Semmens' form is grown under the bush conditions of Gippsland, it has the slight pink colour of the Heyfield form?

HORTICULTURAL FORMS

One of the objectives of this publication is to further the introduction of forms of wildflowers of special horticultural value. This does not necessarily mean the artificial hybridisation between species. In the editor's opinion the best forms of true species excel most hybrids produced to date. However the careful selection and propagation of species with desirable horticultural characteristics is most important and with a few notable exceptions little is being done in this regard. Will readers please report on results of such work?—Editor.

TERRESTRIAL ORCHIDS

The growing of terrestrial orchids in pots is a fascinating interest to a growing number of people. A number of articles follow on different genera.



SOME WINTER FLOWERED PTEROSTYLIS

Described and illustrated by Peter Uhlherr

Left to right: *Pterostylis nana*—common in southern states. Basal rosette of small leaves around flower stem. Small, fairly robust plant. The opening to the galea is very low and wide, labellum not visible. Lateral sepals are stiffly erect.

Pterostylis pedunculata—A common species, widespread and variable in form and colour from almost wholly green through pale brown (Sydney) to very dark purplish-brown (Melbourne). Rosette of dark green oval leaves present at flowering time. The labellum not visible. Sandy seaside to loamy mountain conditions.

Pterostylis grandiflora—One of the largest and most beautiful greenhoods. Rosette of leaves separate from flower stem, 4-8 oval-pointed, bright green with undulating margins. A single graceful flower with near horizontal top to galea in dark chocolate brown, often veined. Labellum is upright and thin, stick-like.

Pterostylis nutans—Widespread and common. Easily identified by the distinctly nodding flowers which may be wholly green or tinged with brown. Labellum curved and protruding through sinus of lateral sepals, which point downwards. Rosette of bright green leaves, variable in shape and size, surrounds the rather robust flowering stem.

Pterostylis concinna—Common and widespread. Small moderately robust plants with basal rosette at flowering time. Labellum does not protrude through sinus but is visible. It is very distinctly notched, dark brown. Flower is beautifully striped in green or white.

Pterostylis longifolia—Widespread and common. Tall plants with 2-12 flowers usually wholly green. The labellum which is more or less rectangular, may be brown or green and is completely visible against the deflexed lateral sepals. As in nearly all greenhoods, the labellum is very irritable and when disturbed it quickly snaps shut, closing the galea. No rosette of leaves is formed, only stem-climbing, long-pointed leaves being present.

MULTI-FLOWERED PTEROSTYLIS

Notes on some of the N.S.W. species by Brian Whitehead

The plants to be discussed include species of *Pterostylis* whose flowering stems commonly bear two or more flowers. This includes the "rufous" group of greenhoods, so named because of the reddish colour of the flowers of some of the species. In addition to these, mention must be made of several other species not covered by this group. N.S.W. is well endowed with *Pterostylis* in this interesting multi-flowered group and can with some justification be called "the home" of several of the species. Flower colour in the group includes translucent red (as in *P. boormanii*), light brown (as in *P. hamata*), red and green (as in *P. parviflora*) and light and dark green as in many of the species. Various species of multi-flowered *Pterostylis* can be found from the coast right into western N.S.W. in suitable habitats. Like so many plants, certain species, such as *P. boormanii*, *P. hamata* and *P. woollsii* are restricted in distribution. Others, e.g. *P. parviflora*, *P. mutica* and *P. longifolia* are more widespread, occurring in a number of different habitats from the coast as far inland as the extreme west of the western slopes area. See colour plate of *P. longifolia* on opposite page.

CULTIVATION OF TERRESTRIAL ORCHIDS

The group is most desirable in cultivation, although not everybody will agree entirely when species with small flowers, such as *P. mutica* and *P. parviflora* are included. In general, the successful cultivation of the group has not been mastered, although much progress is being made. Because of the tendency of several species to inhabit dry hillsides in the inland, it is frequently advised that the pots in which they grow be kept drier than for most terrestrials. This is sound advice, if it is not misinterpreted. What is meant is that excess water and soggy areas should not be allowed to develop. It is essential that a constant level of dampness be maintained throughout the growing season, as is the case in their natural habitat.

The growing compost or mixture can consist of a suitable (say 50/50) mixture of sand and leaf-mould, well mixed, with a dressing of $\frac{1}{2}$ " of leaf-mould on the top of the pot. After the plants appear at the beginning of the growing season, the potting mixture should be made damp only and maintained as far as possible at a constant level of dampness. Pots should be kept away from pests such as slugs and sparrows, in a spot where broken sunlight is received, preferably only in the morning, with shade in the afternoon. Water dripping onto pots during rainy periods should be avoided, as this frequently bruises rosette leaves, leading to further trouble such as rotting of the damaged part.

It seems to be an unfortunate fact that at present, those who grow certain species best are those who live in areas in or near where these species occur naturally. Lack of humidity seems necessary for success with *P. boormanii*, *P. hamata*, *P. woollsii* and some form of *P. longifolia*.

If the areas in which multi-flowered *Pterostylis* are being cultivated are susceptible to frosts, these appear to do no damage to well grown plants. Frozen leaves should be allowed to thaw out normally away from direct sunlight. Damage occurs mostly only to attenuated and over-shaded plants in which long and weak growth has been produced.

GREENHOOD ORCHIDS

"GREENHOODS" IN VICTORIA by David L. Janes

Greenhoods are one of the most popular groups in the Australian native orchids. There are perhaps several reasons for this; their distinctive appearance, the wide range of species and seasons of flowering, their often remarkable abundance, and finally because in general the genus behaves well in cultivation.

The genus *Pterostylis* can be readily divided up into two broad groups by the growth habits of the individuals. Those species which reproduce vegetatively form colonies in nature, and generally are very easy to grow. Those that lack this property entirely, or resort to it only on odd occasions, occur as scattered individuals or loose groups in the bush, and are generally more difficult to grow. Plants of the first group have the ability to develop 2-5 new tubers in a season and may even become embarrassing because of their multiplicity. Last season the author had the problem of disposing of over 4000 tubers of *Pterostylis concinna*. This species and *Pterostylis revoluta* are probably the most prolific in the genus.

CULTIVATION

Cultivation of this group is generally easy under most conditions. The composition of the compost does not seem to be of major importance provided that it is well drained. A good basic mixture however seems to be equal parts of a loam, preferably sandy, washed river sand and organic material such as peat, rotted coastal tea tree leaves or *Casuarina* needles. The colonizers in general respond well to the application of liquid fertilizers. The second more difficult group seems to do best in a mixture of 50% river sand combined with equal parts loam and organic material. Complete repotting into a new mixture each year is essential for the first group but the others can be left for 2-3 seasons.

DISEASES

Both groups suffer severely from the depredations of snails and slugs for which baits are the best control. Other pests include aphids on the buds and flowers, red spider on the foliage and various fungus diseases. Aphids are readily controlled with a pyrethrum base spray but red spider is much more persistent and can be cleaned up with $\frac{1}{2}$ strength *Metasystox* (trade name). Most of the fungus diseases are very difficult to control and the best bet is always to make conditions ideal for optimal growth of the plants. A healthy vigorous plant always has the most resistance to disease. Care should always be taken with synthetic fungicides and insecticides because at full strength many compounds can cause severe damage that can lead to rotting.

The following results with the various species have been obtained from about 5 years experience in both bush-houses and glasshouses under Melbourne conditions.

Pterostylis nutans, *concinna*, *pedunculata*, *curta*, *baptistii*—all thrive and are very easy to grow. They all increase very rapidly in cultivation and are good species for giving massed displays. This group responds particularly well to liquid fertilizers.

Pterostylis hildae is not as vigorous as its counterpart in *Pterostylis curta* but it grows easily and flowers well although slow to reproduce.

Pterostylis pedaglossa is a gem. It is not one of the easiest to cultivate and in my experience increases slowly. However, its neat rosette and quaint flower helps to brighten up the barren late summer months. It needs a sandy mixture and far best results likes moist conditions throughout the time it is above ground.

Pterostylis nana. This orchid also increases slowly but is extremely easy to cultivate and flowers very freely. See colour plate on page 348.

Pterostylis alpina. Very easy in cultivation. This stately species, as with the following one, has a long dormant period underground. It flowers profusely and although it does not form obvious colonies in nature, it reproduces very well in cultivation. The flower size, colour and general health of the plant may be vastly enhanced by potting into a 50/50 mixture of river sand and mountain soil (or krasnozem).

Pterostylis cucullata. This species is very easy in cultivation and reproduces well but seems to be a sporadic flowerer. The flowers themselves must rank amongst the most beautiful in the genus.

Pterostylis falcata. A variable species which grows and reproduces well but unless it is kept moist through November-December, the flower buds may fail to open.

Pterostylis ophioglossa. Very easy to grow, flowers sparsely but reproduces prolifically. Favours a sandy compost.

Pterostylis acuminata. Generally easy and reproduces well but it must be grown in a sandy compost otherwise it rots quickly. Here in Victoria this species will not flower outside but needs the protection of a glasshouse.

Pterostylis acuminata* var. *ingens. Grows easily and flowers well but is slow to reproduce.

Pterostylis revoluta*, *reflexa*, *alata*, *robusta* and *truncata. These species are all Autumn/Winter flowerers which reproduce prolifically but flower very erratically. They are an easy group to grow and prefer a sandy compost.

Pterostylis grandiflora. The Victorian form of this species favours the hill districts and only does well in a mountain soil mixture. The N.S.W. form from the coastal areas thrives in any mixture and reproduces more prolifically than the Victorian counterpart. See colour plate on page 348.

Pterostylis pulchella. Despite its very limited natural range this species grows extremely easily, reproduces well and appears to flower freely.

Pterostylis obtusa. Several forms of this variable orchid have been tried. The best is from the coastal areas of N.S.W. This form increases rapidly and bears its large flowers in abundance. The Victorian form is taller with a smaller flower. It flowers well but reproduces slowly and does best in a mountain soil mix. A form from Mount Tambourine in Queensland reproduces slowly and flowers sparsely.

Pterostylis alveata. Flowers earlier than the Vic. form of *P. obtusa* and reproduces more rapidly. It favours a sandy compost.

Pterostylis longicurva* and *P. toveyana reproduce well and grow easily in a sandy compost but so far have been shy of flowering.

Pterostylis decurva. A summer flowering species favouring moist cool habitats. It grows well and prefers a mountain soil mix but for best flowering the plants should be kept moist after the rosette has withered away in early Summer. It reproduces slowly.

Pterostylis coccinea thrives in cultivation where it reproduces rapidly but flowers tardily. It may respond to the same treatment as for *Pterostylis decurva*. See colour plate on page 348.

Pterostylis cynocephala. In the author's experience, this is the only one of the group with the deflexed lateral sepals which grow well and increases in cultivation. It needs a sandy compost.

Pterostylis tenuissima. This is the only species in this broad group which has failed completely in cultivation. We all learn by our mistakes and I think that this plant will prove amenable.

Pterostylis rogersii*, *hamiltonii* and *russellii apparently grow and reproduce well in cultivation but the writer's experience with them is limited to one season.

Pterostylis longifolia. Several forms of this orchid exist, all of which do reasonably well in sandy mixtures with the exception of a tall dark tongued form from the hill districts which favours a mountain soil mixture.

Pterostylis vittata performs well for a couple of seasons but then appears to slowly decline. It is apparent that something is lacking for the successful growth of this lovely species. It favours a sandy compost and does not reproduce vegetatively.

Pterostylis recurva has performed extremely well in the two seasons the author has tried it but with no evidence of vegetative reproduction. A coarse sandy compost is best.

Pterostylis foliata* and *Pterostylis vereanae reproduce slowly if at all and do not thrive. These need more investigation as theoretically they should prove as easy as *Pterostylis alpina*.

Pterostylis furcata grows and flowers very well but shows no sign of reproduction. It performs best in a mountain soil mixture.

Pterostylis parviflora. This frustrating little orchid should do well but in practice it performs poorly, rarely persisting for more than one season. The species is extremely variable but no form tried so far has proved amenable to cultivation.

Pterostylis daintreana. Material of this species has been kindly sent over from N.S.W. on two occasions but in neither case have the plants survived. It appears to be even more difficult than *Pterostylis parviflora*.

Pterostylis barbata grows all flowers well but apparently does not reproduce vegetatively at all. It favours a sandy compost and likes plenty of room, a 6" pot is ideal.

Pterostylis mutica. The author's experience with this species does not tally with other growers. The plants reproduce slowly, decline and die out and compost does not seem to make any difference. These results are quite surprising considering how well its ally *Pterostylis cynocephala* does.

THE RUFA GROUP

These are difficult with the exception of *Pterostylis pusilla* and *P. rufa* (Vic.). The plants seem to die out suddenly while dormant in Summer and for no apparent reason. *Pterostylis pusilla* is the only one to reproduce regularly by vegetative means although others of the group do so at odd times. *Pterostylis pusilla* var. *prominens* has also proved easy. The difficult ones tried are *Pterostylis rufa* (N.S.W.), *P. woollii*, *P. squamata*, *P. mitchellii* and *P. boormannii*. See page 374 for descriptions.

NEXT ISSUE—Dec. 1968, will be on the group of species of *Dendrobium* that comprises *D. linguiforme*, *D. canaliculatum* and *D. wassellii*. Will readers please report experiences without delay, especially on the last one. Further notes on *Pterostylis* species are planned for our March 1969 issue. Reports on species not mentioned to date, are desired.

BEARDED ORCHIDS

CALOCHILUS IN VICTORIA by D. L. Jones

Calochilus is a small genus of eleven species, seven species are found in Victoria. All species are described in the no. 34 issue with a colour plate.

Calochilus grandiflorus Rupp. This is the most recent find in Victoria being represented by a single specimen from the North East. With luck this magnificent species may prove to be more widespread.

Calochilus imberbis R. S. Rogers. A remarkable form atypical of the genus because it lacks the characteristic hairs on the labellum. In the field it is often associated with *Calochilus robertsonii* which it closely resembles in all details except the naked lobellum. It is not common and most specimens are a dull green compared with Nicholls' colourful illustration (Orchids of Australia). Such highly pigmented *Calochilus* are typical of the Rushworth area of Victoria where his specimen came from. Flowers from the Gisborne area of Victoria are tardy in opening as in some *Thelymitra* species and the powdery pollen is suggestive of cleistogamy.

Calochilus richae W. H. Nicholls. A very rare plant remarkable for its appearance in 1928 and virtual disappearance since. Nicholl's illustrations indicate that the species may be an intermediate link between *Calochilus imberbis* and *Calochilus robertsonii*.

Calochilus campestris R.Br. Widespread in Victoria but in my experience not common near Melbourne.

Calochilus saprophyticus R. S. Rogers. A strange combination plant with a saprophytic root system and chlorophyllous sheathing bracts rather than leaves. It is often very pale green in colour and is easily bypassed in the bush. It responds actively to bushfires when large patches may be found where only solitary specimens have been collected previously.

Calochilus robertsonii Benth. Easily the best known member of the genus in Victoria. It is widespread in Victoria and common in many localities close to Melbourne. It is variable in colour, albino specimens being well known as well as all green flowers.

Calochilus paludosus R.Br. The most beautiful member of the genus in Victoria. Its distribution is more restricted than other members but it is common in many areas close to Melbourne. This however may be a disadvantage because of the rapid spread of housing into surrounding lightly timbered areas and already many of its localities are threatened.

CULTIVATION OF CALOCHILUS

Unfortunately the genus *Calochilus* in general performs very poorly under artificial pot cultivation. No species with the possible exception of *C. saprophyticus* reproduces vegetatively. The best results up to date have been obtained with a well drained coarse sandy medium under glasshouse conditions. In such a way the author has kept *Calochilus robertsonii* five years and *C. imberbis* three years. *C. paludosus* and *C. campestris* never seem to last past one season in the writer's experience. In no case have the plants really thrived, as some other terrestrial species do, and it appears that something essential is lacking which may turn up with experience. The general result is a good first season followed by a slow decline which is not prevented by annual repotting.

DIPODIUM ENSIFOLIUM

A TERRESTRIAL ORCHID OF QUEENSLAND by P. Butt

How many times have we gazed longingly at that gem of the terrestrials *Dipodium punctatum* and silently wished it could be cultivated. Perhaps this will be achieved in the near future, let us hope so.

However, after close observation of *Dipodium ensifolium*, the northern cousin of *punctatum*, I found that here is a *Dipodium* with equal charm and perhaps even greater beauty than the variety we know so well here.

Dipodium ensifolium occurs throughout areas north of Sarina to my knowledge and perhaps even farther south. Specimens I accounted were growing quite prolifically in fields of small grass trees beside the Bruce Highway.

Unlike *D. punctatum*, this plant has leaves which resemble the semi-terete *Vanda* in appearance, though grass-like in texture. The plants I saw attained a height of about 12 to 18 inches not including the flower stem. The orchid is found growing close to the trunks of the small grass trees, among small ferns and tufts of grass.

The colour of the pale green leaves contrasts with the yellow stem of the inflorescence and the spikes of beautifully variegated blooms. Flower colour is variable, I found three shades in a half hour search. Shape and size are similar to *punctatum* except that labellum is wider and longer. Sepals and petals are soft shell-pink marbled with rose-pink to red spotting, labellum is off-white in throat with yellow stamens blending to deep plum shade across whole frontal section of labellum. Roots are off-white and fleshy typical of all the orchidaceae.

I also noted that the fields where this orchid occurs would possibly be rather swampy in rainy periods, and that open clearings practically devoid of the native *melaleuca* is where they thrive best.

This *Dipodium* seems to respond very well to cultivation under varying conditions. After 12 months of quite adverse weather and conditions entirely different to its habitat a plant is still growing in my garden. Another clump planted in a large pot with a potting medium similar to its native terrain, is growing well and flowered.

Editor's Note: All species of *Dipodium* are fully described with details of cultivation and a full colour plate of *Dipodium punctatum*, which is somewhat similar to *D. ensifolium*, as above, in the No. 14 issue.

GROWING CALOCHILUS — A DIFFICULT PROPOSITION by Brian Whitehead

Despite several attempts to find a successful means of growing the interesting and novel plants of this genus, I have as yet been unable to keep plants growing for more than two seasons. Various potting mixtures, based on sand and leaf mould mixtures, have been tried.

The plants may flower quite well the first season after cultivation commences, but it is soon discovered that only a relatively small tuber has replaced the large old one. The following season a leaf only appears.

I feel that further experiments in the field of growing *Calochilus* will have to be based on attempts to grow these orchids in a Native garden among the other plants. Those fortunate enough to have a Native garden not far removed from its original state may make the first steps towards successful cultivation of *Calochilus*.

LYPERANTHUS

ORCHIDS IN TASMANIA by M. John Firth

Tasmania has two kinds of *Lyperanthus* neither of which seems quite at home in our bush. Most of our other native orchids seem to fit into the Tasmanian scene. We have some which are quite quaint, such as *Corybas* and *Chiloglottis*, and a few quite showy ones such as many of the *Caladenia*, *Dipodium* and *Cryptostylis*. None of these seems to have much difficulty in blending into the natural bushland background. They may be unusual or differ greatly from surrounding plants, but, nevertheless, they give the impression of being at home.

On the contrary, our two *Lyperanthus*, never seem to be quite at ease here. This particularly applies to Brown Beaks (*L. suaveolens*). These are to be found in this State, only on the East Coast. Although their blooms are quite large and are lifted from 1 to 2 feet above the ground, they are most difficult to see. Amongst bracken and saggs and heath, the flowers blend with the vegetation and only the sharpest eyes can pick them out. You may be looking at a plant sporting five or six big flowers, and can see nothing but uninteresting vegetation. Then suddenly, like a puzzle picture in a child's book, the flower cluster springs from its background. How did you miss it before? It is hard to believe that it was there all the time you were searching. Then to confound you utterly, half a dozen more showy blooms appear. They are such exasperating orchids that one almost imagines they are deliberately hiding; and yet, it is not as though they have been enjoying a game of hide-and-seek. They are too timid, and strait-laced to indulge in such frivolity. No, they appear to be foreigners, not quite at home here. Perhaps they are the remnants of an invading French army, which landed on the coast in the early days of colonization—purely a scout troop, you understand, with the strictest instructions to spy out the land without being seen. After all these years, they still tiptoe inland with stealth and care.

Brown beaks have quite brightly coloured flowers, while their leaves are a normal green. In spite of this, strangely enough, it is much easier to sight the leaves than the flowers. Look for a leaf up to six inches long, ridged beneath the rather pale in this section, tapering at both ends, and with the lower end forming a thickish stalk rising directly from the ground. The upper side is a brighter green. Yes, it is far easier to locate Brown Beaks by searching at ground level for the leaves, and from these following up the flower stalks to find the flowers. Remember, though, that you may locate a dozen leaves before you sight one carrying flowers.

Now, while Brown Beaks are suave and timid and retiring our other *Lyperanthus*, Red Beaks (*L. nigricans*) is a swash-buckling type; a fiery customer quite out of place in our bushland. Red Beak leaves differ greatly from those of Brown Beaks. They are broad, rather fleshy, and almost heart-shaped, and are pressed flat on the ground, often forming a green mosaic. These leaves may be over 3" long and 2" wide—quite a bit bigger than the *Acianthus* leaves they resemble. The unwary, having located a large patch of these leaves early in the season, naturally expects to find flowers later. Usually they are disappointed. Red Beaks have the peculiar habit of flowering freely only after fires.

Sometimes, therefore, one sights quite extensive areas of Red Beak leaves but few, if any flowers; or one may find an area of fire-blackened

soil without a plant; or, following this, one may be fortunate enough to find masses of flamboyant blooms bursting to life, phoenix-like, from the ashes of last season's fires.

Red Beak flowers remind one of American Indians. They have great hooked noses, and sport magnificently coloured plumed head-dresses. They look like groups of fierce warriors on the war path.

Strange orchids, our two *Lyperanthus*, neither quite at home in our conservative bushland.

Editor's Note: All species of *Lyperanthus* are fully described with details of cultivation and a full colour plate in our No. 12 issue.

ORCHIDS — HOW TO GROW

Mr. R. C. Nash is leader of our Terrestrial Orchid Study Section and readers wishing to learn how to grow orchids may join the section by enquiring through the editor. In previous issues he has described various experiments that readers can make and a few more are given below.

(a) To test the effects fertilizers have on the storage qualities of the tubers during the dormant time.

Select 4 groups of plants of the same species (and as many species as possible), give the first and second groups no fertilizer during the growing period and apply moderate amounts of nitrogenous fertilizers to groups three and four. Leave groups one and three in the pots during the dormant period as normal and remove two and four from the pots at this time and store.

Note the numbers of plants before and after the dormant period in groups one and three and the numbers of tubers put down to storage and the numbers that survive storage in groups two and four. How many tubers rotted or dried out and from which group. Heavy fertilization of potatoes seems to effect their storage qualities and it would be interesting to know if the same applies to the orchid tubers.

(b) An experiment on seed germination.

Again select 2 groups of plants of the same species, one plant in a pot for each group is all that is required. With the first group plant the seed of this species just under the soil near the parent plant when the seed falls. During the later part of the dormant period plant some seed in a similar manner near the place where the parent plant will appear when it grows in the second group.

Which group has the seeds germinate and how many?

(c) Another seed germination experiment.

This time, place an amount of leaf litter and other composty material in a quiet well protected spot. On to this litter, dust the seeds of known species of orchids at the time seed normally falls.

During the later part of the following winter very carefully examine the litter for young plants. They will be very small with perhaps one or two very small leaves so be careful.

To continue with this experiment, leave half of the seedling plants in the litter and carefully plant the rest in the normal composts for this species and place in a well protected spot.

All aspects of seedling growth, numbers seen, species tried and those that grew, time to the first flowers and any other interesting details should be noted and reported.

Supplement to *Australian Plants*, September, 1968

AUSTRALIAN FLORA IN COLOUR



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Supplement to *Australian Plants*, September, 1968

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of VICTORIA

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The illustrated plants are grouped in sections according to their most commonly occurring habitats. Thus plants most likely to be found in coastal areas, on heathlands, in mountain forests, or the alpine areas, etc. appear in the appropriate sections of the book.

The captions and text introduce many revised names and the book is a valuable contribution to Victorian botany in this regard alone.

The techniques of modern colour photography, coupled with the latest skills of colour reproduction and printing, combine to make this an aesthetically pleasing book and a reference work of great value to the serious botanist, the amateur naturalist and the interested layman.

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THE AUTHORS

G. ROSS COCHRANE: A New Zealand biogeographer who has done extensive Australian botanical research over a nine-year period. His contribution is the chapters that supplement the colour plates.

BRUCE A. FUHRER: Has been a professional photographer and is now on the business side of photography. He is active in Victorian naturalist and conservation movements and has contributed a large number of colour plates to the book.

EDWARD R. ROTHERHAM: Senior lecturer in photography at the Royal Melbourne Institute of Technology and is an experienced naturalist. He acted as chairman of the editorial committee and was responsible for many of its colour plates.

JAMES H. WILLIS: Assistant Government Botanist in Victoria and the author of several books and numerous scientific papers. He was substantially responsible for the identification of difficult subjects and described all the flowers and plants illustrated.

Supplement to *Australian Plants*, September, 1968

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FLOWERS AND PLANTS OF VICTORIA

This would undoubtedly be the best book for the pictorial presentation of Australian wildflowers ever produced. While it is produced for Victorians to readily identify their wildflowers by simply referring to excellent colour plates, it is of equal interest to all nature lovers in the south eastern states of N.S.W., S.A. and Tas. as so many of the plants are widespread throughout the whole area.

Not only will the tremendous range of species shown in the 543 colour plates amaze the reader but what is really impressive is the high standard of the photography and reproduction. The descriptions accompanying these 543 colour plates are simple and accurate and the author has also been able to present in simple terms, information about each plant that is of interest to all lovers of wildflowers.

What impressed me is that, not only are all the more showy wildflowers shown, but also those dainty little plants that hide away and startle you with their show or uniqueness when in flower. In fact even a wide range of plants and ferns that have insignificant flowers but are of special horticultural interest because of their form or foliage, are shown in full colour.

Every one interested in the cultivation of wildflowers whether they live in Victoria or not should have a copy for reference.

READERS—IF YOU WISH TO SUPPORT THE EDITOR AND THE CONTINUED PUBLICATION OF "AUSTRALIAN PLANTS" TO ITS PRESENT HIGH STANDARD, ORDER YOUR COPY OF "FLOWERS AND PLANTS OF VICTORIA" THROUGH THE EDITOR AS DIRECTED ON THE PAGE OPPOSITE. Not only will you be delighted with your purchase of this large beautiful book, but you will be giving me direct support and encouragement in a practical way. If you do not wish to tear off the ordering blank, then a simple note accompanying your cheque will serve. Editor.

FLAX LILIES

DIANELLAS IN THE GARDEN by Marian Beek, South Australia

Dianellas, or Flax lilies, are often overlooked in the bush, but with their long strap-like leaves they are most attractive planted beside a pool or grown as a ground cover between taller plants.

Dianella revoluta is quite common and grows practically everywhere, but it has many forms and over the years I have collected some of them. The most common form is a very untidy-looking plant, forming underground runners which produce new plants some distance away and covering quite a bit of ground. The drooping, starry, deep blue flowers on long stiff stems are borne in spring and followed small, round darker blue berries. There is one rare form with pure white flowers but I have not yet seen the berries of this plant; and another form has blue green leaves and very small pale blue flowers but they all have the same untidy habit of growth. However, some forms make neat, round clumps and they are really worth growing. Close to Lucindale I collected such a plant, with handsome blue-green strap-like leaves. The flowers are pale blue and borne in profusion, which make it quite showy and the berries in summer are white!

Dianella laevis is a different species and well worth growing. It makes a clump of long blue-green leaves which are quite broad. The soft blue stars on very tall stems have conspicuous yellow anthers and are fragrant on hot, sunny days. The purple berries are very handsome and they stay on the plant for a long time.

Dianella tasmanica is native to Victoria and Tasmania. It is a robust plant, with flower stalks about 5 ft. high and pale blue flowers followed by beautiful oblong, turquoise berries.

All the Dianellas are very easy to grow. They can be raised from seeds or grown from a root division. Do not overlook these plants as being too common or not being showy enough, but plant a clump in your garden in that odd corner as a contrast to your other shrubs.

Editor's Note: I am advised that the correct naming of species of *Dianella* is not properly resolved. Readers may care to comment on other species that they know. I would like reports on plants in the family Liliaceae as it is time that we had an issue devoted to it.

ORNAMENTAL CONIFERS

ARAUCARIA CUNNINGHAMII VAR. GLAUCA

by K. KENNEDY—Reprinted from the *Townsville Naturalist*

Of late years it has become the fashion to place a small pine tree on the table as decoration for Christmas dinner. The idea, of course, is to create the atmosphere of the lands from which our ancestors came—regions of pine forests, snow and cold north winds.

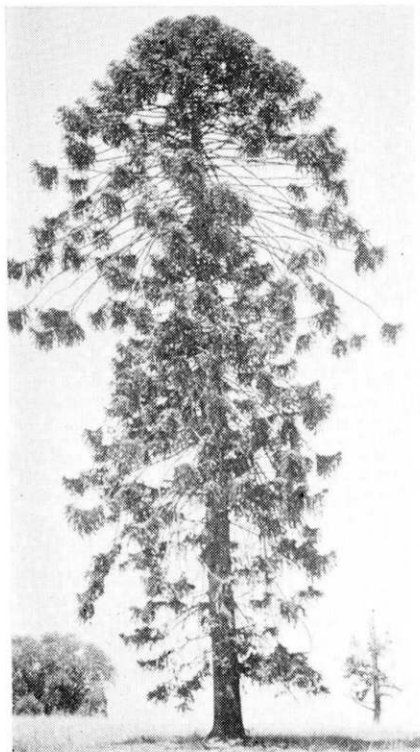


Photo: Jean Walker

Araucaria bidwillii

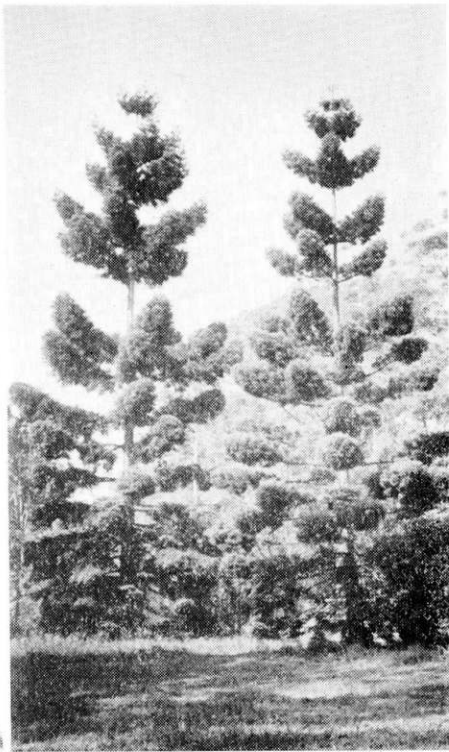


Photo: Betty Maloney

Araucaria cunninghamii

Editor's Note: The Australian conifers were fully described in our no. 34 issue together with very clear sketches to aid identification and details of cultivation and propagation.

However, pine trees are not exclusive to the Northern Hemisphere, but are found in many parts of the world and in most kinds of climates. They belong to the Order Coniferae, which means cone bearers, and are divided botanically into families. One classification gives seven families, they are Taxaceae, the yews; Podocarpaceae, the podocarps; Cephalotaxaceae (not found in Australia); Pinaceae, the true pines of the Northern Hemisphere; Taxodiaceae; Cupressaceae, the cypress pine; and Araucariaceae.

Sailing along the coast of North Queensland, one is surprised to see that instead of tropical forests of palms, many of the off-shore islands are covered with pine trees. These belong to the family Araucariaceae, and

are known to botanists as *Araucaria cunninghamii* var. *glauca*. The specific name honours the great explorer-botanist Alan Cunningham. *Glauca* means bluish-grey colour because seen at a distance the leaves are that colour. Strange to say, I have never seen it growing on the mainland coast in a wild state, although probably others have.

Members of the family *Araucariaceae* cannot be mistaken for other conifers for the trunk grows straight up like a mast, and the branches are evenly distributed at an angle to the trunk becoming smaller and smaller as they near the summit. Like all conifers *Araucarias* are gymnosperms, which means that their seeds are not enclosed in a seed vessel, but lie on woody bracts which are grouped together to form a cone. These bracts are really altered leaves. Before the seeds mature, the bracts are united making a green cone. When they are ripe the cone dries up and the bracts separate to release the seeds which are then distributed by the wind. The way to gather the seeds, is to collect the cone when almost ripe and put it into a paper bag. When the cone dries and the seeds released, they will be retained in the bag. This does not apply to *A. bidwillii* (the bunya pine) which has heavy seeds that do not become wind borne.

Geologically speaking, conifers are much older than angiosperms (seed vessel plants), for they were plentiful away back in early Mesozoic times, some 160 million years ago. Angiosperms with their seed vessels did not evolve until the end of the Mesozoic era some 40 million years later. The latter gradually became dominant, and now comprise the greater part of the earth's vegetation. However, the conifers still hold their own in parts of the world, and today supply most of the soft wood timber used in commerce.

The flowers of *Araucaria*, as in other conifers, are of two kinds; those producing pollen and those producing seeds. Usually in *Araucarias* they are dioecious, which means that the pollen flowers are on separate trees to the seed flowers. However *A. cunninghamii* is exceptional for both kinds of flowers are on the same tree, so are termed monoecious.

The leaves of *A. cunninghamii* var. *glauca* are small, rigid, oculate, and are rough to the touch. Because of this the tree can endure hot dry winds. See *Australian Plants* 34, 263 for a sketch of *Araucaria*.

Cultivation—If grown in a pot they are slow growers. Soil should be sand mixed with decomposed granite. One which as a seedling I scratched up from a road-side gutter on Magnetic Island has graced our Christmas table regularly for many years and is still small enough for several more.

FLORA OF TASMANIA

In response to suggestions from various quarters, Lord Talbot de Malahide is planning to include in the forthcoming second part of "The Endemic Flora of Tasmania" an appendix giving cultural advice about how to grow the plants illustrated in Parts 1 and 2. He would accordingly be very grateful if any reader who has grown any Tasmanian wildflowers, would kindly write and give him the benefit of his or her experiences and in particular state whether he or she

- (1) still grows the plant; if not, can suggest the cause of death and say how long it survived;
- (2) obtained it from seed, cutting, graft, layer, as a wild plant or by purchase or exchange;
- (3) can recommend any special cultural treatment, with particular regard to soil, drainage and wind shelter.

ANDERSONIA—continued from page 343

3. *Andersonia caerulea* R.Br. One of the most widely distributed species (in general terms Perth to Albany), it is also, probably the most variable. Several forms exist which may perhaps be ecotypes, whilst habit and leaf form vary, floral features are constant. Flowers exhibit a range of colours; sepals pink, mauve, or blue and may be even white; petals usually blue; filaments often pale mauve; style is whitish at the base progressing through pink and mauve to almost black near the stigma. Flowers all year.

4. *Andersonia macranthera* F. Muell. Leaves tend to be grouped towards the end of the branches leaving the main stems bare, this gives the plant a slender appearance. Found from Esperance Bay to Israelite Bay. Flowers winter-spring.

5. *Andersonia heterophylla* Sond. forms a white flowered shrub 20-30 cm. high. It is distributed from Perth northward to Jurien Bay and inland to Mogumber, usually in sandy heathlands. Similar to the preceding species with regard to the main stems which are frequently leafless. Flowers spring-summer.

6. *Andersonia micrantha* R.Br. A small bushy shrub 10-30 cm. high bearing white flowers, the corolla-tube and the lower half of the corolla-lobes are pubescent. *A. micrantha* appears to have a disjunct distribution being found around Busselton and also around King George's Sound. Flowers spring-summer.

7. *Andersonia brevifolia* Sond. A white flowered shrub 30-45 cm. high, found 50-120 miles east of Perth. Main feature distinguishing this species from the preceding is the glabrous corolla-lobes, occasionally the pubescence in the throat of the corolla-tube may extend to the base of the lobes.

8. *Andersonia axilliflora* (Stschegl.) Druce. A tall sturdy shrub often between 2 and 3 m. high, occurring at relatively high altitudes in the Stirling Range. The usually erect, lanceolate leaves vary in length from 20-55 mm. The terminal inflorescence of creamy-white flowers is more or less oblong, often containing more than 30 flowers with the apex withering after anthesis. Flowers spring.

9. *Andersonia echinocephala* (Stschegl.) Druce. Found in the Stirling Range, this is a tall, spiny shrub (often exceeds 1 m.) with lanceolate, acuminate leaves 5-30 mm. long, usually twisted and undulate. The capitate, terminal inflorescence often contains more than 15 creamy-white flowers. As in *A. axilliflora* the apex withers after anthesis. Flowers spring.

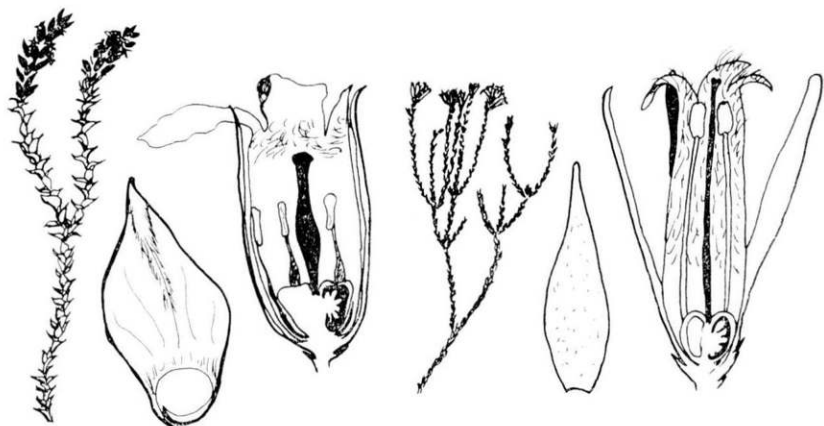
10. *Andersonia setifolia* Benth. This frequently cushion-like plant which rarely exceeds 15 cm., bears terminal groups of 2-4 (10) red flowers. It has been recorded from the environs of King George's Sound, Mt. Manypeaks and the Stirling Range. Flowers winter-early summer.

11. *Andersonia aristata* Lindl. This species is sometimes commonly known as "Rice Flower", because of a superficial resemblance to *Pimelea*. The flowers are arranged in terminal groups of 2-10 (15). The colour of the corolla varies from white to pink, the corolla-lobes are recurved and densely bearded. Occurs in the area from Perth south to Cape Leeuwin. Flowers spring.

12. *Andersonia gracilis* DC. A slender shrub $\pm$ 30 cm. found in the Perth district. Similar to the preceding species but corolla, style and stamens do not exceed the calyx. The densely bearded white corolla-lobes are not sharply deflexed. Flowers spring.

13. *Andersonia simplex* (Stschegl.) Druce. A prickly shrub 15-40 cm. high with terminal, oblong or spinate inflorescences, each containing ± 20 flowers and terminated by an apical multibracteate flower. Acutely keeled bracteoles subtend the sepals which are usually pink but sometimes mauve; the corolla is blue or mauve. Distributed from King George's Sound to Hood Point and inland to the Stirling Range region. Flowers late summer-early spring.

14. *Andersonia bifida* L. Watson. Found between Bridgetown and Kojonup this species is characterised by the acutely bifid, relatively large and conspicuous anthers. Very similar in habit to *A. parvifolia*, however the inflorescences rarely terminate the shoots, which often continue growth after anthesis.



Andersonia simplex (left)—Branch $\times \frac{1}{2}$ full size, leaf $\times 5.5$, flower $\times 8$.

Andersonia parvifolia (right)—Branches $\times \frac{1}{2}$ full size, leaf $\times 15$, flower $\times 7.5$.

15. *Andersonia parvifolia* R.Br. This appears to be most widely distributed species being found in an area bounded by Nornalup, Israelite Bay and Wagin. A slender shrub 15-30 cm. high with terminal inflorescences of 4-10 pink or mauve flowers. The apical shoot withers after anthesis. Flowers spring-summer.

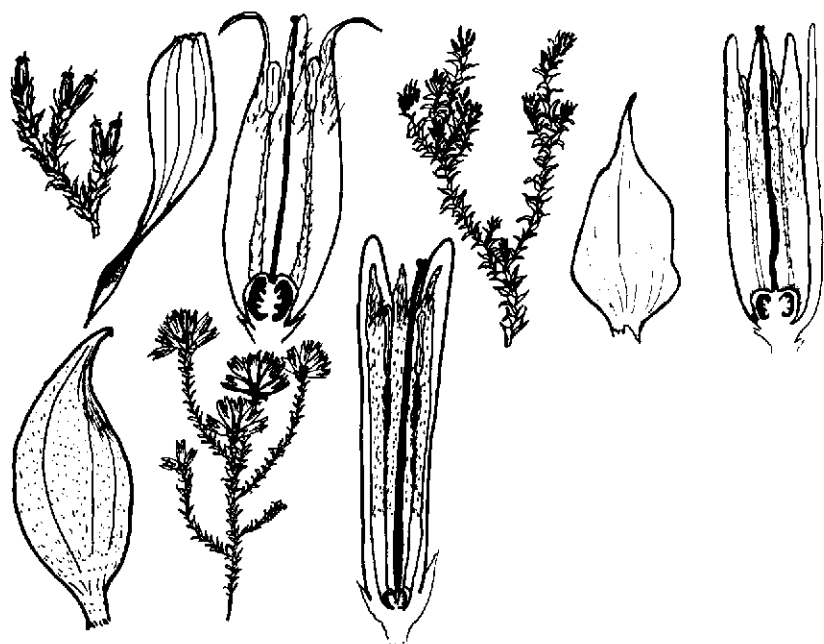
16. *Andersonia carinata* L. Watson. The globose terminal inflorescence is terminated by a single multibracteate flower. The flowers are pink or mauve. The slightly flattened filaments of the stamens are dark red. An erect shrub often exceeding 20 cm., *A. carinata* appears to be an inland species growing in sandy habitats; north of the Stirling Range, west to Lake Wagin and east to Coolgardie. Flowers spring.

17. *Andersonia grandiflora* Stschegl. This cushion-like plant which rarely exceeds 15 cm., bears deep red flowers which usually do not terminate the shoots. It is only recorded from the Stirling Range area.

18. *Andersonia longifolia* L. Watson. No definite locality has been recorded for this species, as no localities have been provided on specimens so far collected, however it is thought to occur west of the Darling Range. Leaves are lanceolate, acuminate with spreading or somewhat incurved tips, subspirally twisted. The oblong inflorescences containing 20 or more flowers, terminate the branch as the apical shoot withers after anthesis.

19. *Andersonia latiflora* (F. Muell.) Benth. An erect shrub which usually exceeds 30 cm. in height, with ovate to lanceolate-acuminate, sub-spirally twisted leaves. This species is recorded from the Darling Range. Flowers spring.

20. *Andersonia sprengelioides* R.Br. A squarrose shrub, 5-30 cm. high found around King George's Sound and in the Stirling Range. The flowers which have a pink calyx and blue corolla are grouped into a terminal, bunched inflorescence, the apical shoot of which withers after anthesis. This species exhibits a range of leaf shapes varying from ovate to lanceolate, as well as in overall size. Flowers spring-summer.



Andersonia grandiflora (top left)—Branch $\frac{1}{2}$ full size, leaf $\times 4$ and flower $\times 3.5$.

Andersonia sprengelioides (top right)—Branch $\times \frac{1}{2}$, leaf $\times 5.5$ and flower $\times 5$.

Andersonia lehmanniana Branch $\times \frac{1}{2}$ full size, leaf $\times 8$ and flower $\times 4.5$.

21. *Andersonia lehmanniana* Sond. This species is composed of two subspecies. Subsp. *lehmanniana*: a bushy shrub often up to 50 cm. high with leaves usually 3-7 mm. long, lanceolate-acuminate, with spreading erect or $\pm$ incurved tips; the apical shoot of the inflorescence withers after anthesis. Found in the Perth district. Flowers winter.

Subsp. *pubescens* (Sond.) L. Watson: A more slender plant $\pm$ 30 cm. high, the leaves are usually 1-4 mm. long, $\pm$ appressed, or having the tips incurved and almost touching the stem, degree of pubescence varies. Inflorescences frequently do not terminate the shoots, the individual flower has a pink calyx and a blue corolla. Found inland to subsp. *lehmanniana*, but areas may overlap. Flowers winter.

22. *Andersonia involuacrata* Sond. grows in sandy soil from Perth to Busselton, it is a slender shrub 15-30 cm. high. The flowers of the capitate inflorescences are flattened in the plane of the subtending bracts. The apical shoot withers after anthesis. Flowers spring-early summer.

ANDERSONIA—continued from page 341

Andersonia caerulea: A low, open, rigid stemmed shrub to 15" found growing on sand in 15" to 20" rainfall. Leaves are narrow triangular, $\frac{3}{8}$ " long and $\frac{1}{8}$ " wide, in the lower part they sheath the stem, then become spreading and finally upright, fairly rigid, more or less opposite or alternate, fairly close together and light green in colour. Corollas are blue, $\frac{3}{8}$ " long and $\frac{1}{8}$ " wide, in 3's or 4's on $\frac{1}{4}$ " branchlets, surrounded by $\frac{3}{8}$ " long, narrow and attractive pink sepals. The flower heads are oblong, dense and about 2" in length. Flowers May-August.

A very attractive small species for exposed situations in small gardens.

Andersonia setifolia (inland form): An open, spreading, rigid stemmed plant to 5" found growing in sand or granitic loams in 15" rainfall. Leaves are narrow triangular, up to $\frac{1}{2}$ " in length and $\frac{1}{8}$ " wide at the base, rigid, light green in colour, more or less opposite and alternate, very close together, sheathing the stem in the lower portion, becoming upright and very close to the stem. Flowers are narrow, $\frac{3}{8}$ " long, upright, red in colour, from 5 to 9 forming close terminal heads. The unusual feature of the flowers of this species is that the red filaments extend up to $\frac{1}{2}$ " beyond the flowers. Flowers in July and August.

An attractive small species for exposed situations in rock or miniature gardens.

Andersonia simplici: Grows as an open, rigid, light red stemmed shrub to 12" on sand in 20" rainfall. Leaves are sheathing, triangular, over $\frac{1}{8}$ " wide at the base, $\frac{1}{4}$ " long, rigid, bright green in colour, held at right angle to the stem, spaced about $\frac{1}{8}$ " apart and arranged more or less in a spiral around the stem. Corollas are light pink, about $\frac{1}{4}$ " long and $\frac{1}{8}$ " in diameter, surrounded by 5 narrow sepals the same colour and length as the flowers. Flowers are sessile in conical heads about an inch long with the flowers opening from the base. Flowers from July till September.

A good species for exposed situations in rock or miniature gardens. Will stand poor drainage.

Andersonia lehmanniana spp. pubescens: Forms a relatively dense, spreading, much branched shrub to 12" on sand in 20" rainfall. Leaves are narrow triangular, $\frac{1}{8}$ " long, opposite or alternate, close together, fairly rigid, in the lower portion sheathing the stem, then becoming upright with the tips curved in towards the stem and they are light green in colour. Flowers are very narrow, almost $\frac{1}{2}$ " long, deep pink to light purple in colour, from 4 to 12 in spreading terminal clusters, carried in profusion so as to almost cover the entire plant when in full flower. Flowers in August.

A very attractive small species which would make an excellent border or specimen plant.

HIBISCUS

There is in preparation, an article dealing with the following species of Hibiscus and their forms: *Hibiscus sturtii* Hook., *H. krichauffianus* F. Muell var. *chippendalei* var. nov. and *Urena spenceri* syn. *H. spenceri*. Would readers who have colour slides or who are in a position to obtain specimens, please contact the editor.

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FIREWHEEL TREE

Stenocarpus sinuatus—A series on "Street Trees" by H. Oakman

Some of our native trees have gained almost immediate popularity while others, equally attractive, remain practically unknown. The "Firewheel Tree" is one of the former and it can be found in public parks and private gardens throughout Australia. In spite of this it is not extensively used for street planting. One reason for its popularity is the curious flower bud which is in the form of a three inch miniature cart-wheel with "spokes" radiating from a central hub. The flowers are a brilliant red and are in clusters distributed over most of the crown. Some trees make a splendid display by producing their flowers near the tips of the branches but others tend to hide their floral beauty in the shadow of their outer foliage. There is in fact a great deal of variation in its flowering habits and as stock is generally raised from seed, the display qualities of each tree is unknown until it begins to flower and this could be seven or even twelve years after it is planted. Flowering time is between January and March.

"The Firewheel Tree" is a native of the coastal rain forests from the Bellinger River (N.S.W.) to the Atherton Plateau (Qld.); it is found in deep rich soil areas of ample moisture with a minimum monthly rainfall of 150 points. If the tree is not given good quality loam and kept well watered, it will remain stunted: many street plantings have failed for this reason.

The tree is evergreen with a dense crown of deep green foliage. The leaves are glossy, dark green, paler underneath and have deeply lobed margins; they are variable in size and shape; sometimes 6" and almost oblong in other trees pinnatifid and 12" long. The bark is dark grey and has a coarse texture.

"The Firewheel" is a member of the Proteaceae; as its generic name implies—narrow-fruited—the seedpod is two to four inches long, narrow and boat-shaped; in it are up to ten overlapping papery seeds. These germinate readily while fresh and the seedlings are not difficult to raise. In its native habitat, it is a comparatively rare tree but its timber has some commercial value in that it resembles English Beech and it is put to much the same uses, i.e. ornaments and turnery. Local uses include general building, flooring and palings. Common names for it in the timber trade are "White Beefwood" and "White Oak". The aboriginal name for it was Yiel Yiel. The shrub *Beedwood*, *S. salignus*, is a better known timber tree.

Growth nearly always tends to be columnar and although the Firewheel Tree can stand fairly hard and regular cutting back, such treatment will seldom induce it to form a bushy crown as almost invariably one or two new leaders will again become dominant. It follows that the only suitable place for it as a street tree is where there are no overhead wires. The fastigate habit of growth and its tendency to develop a "clean" stem does, however, make it ideal for narrow footpaths or nature strips. In these it will provide maximum visibility, practically no obstruction, and a dense evergreen screen which is most effective in hiding tall buildings that are right on the property line. Height can, under natural conditions, be up to 100 ft. but cultivated trees rarely exceed 30 feet in height. Growth is slow and young trees need protection from frost. The highlands are too cold for it but many excellent trees can be seen growing in Southern Victoria, in Western N.S.W. and it has been used as a street tree in many of the Sydney suburbs and in some streets in Brisbane.

S. M. Mills, Wahroonga, N.S.W., writes of the Firewheel Tree:

What a magnificent sight this tree can be. I saw such a splendid specimen the other day (March) that I must write about it. The tree stood about 20 ft. high and was covered in blooms from tip to base, with about an equal amount of the glossy green leaves. The flowers radiate from the stalk just like the spokes of a wheel four inches across. The flowers are a brilliant vermillion red with a touch of carmine and the tips are chrome yellow. The birds seem to love the seeds.



TASMANIAN CLIMBERS

by A. M. GRAY. The article supplements the No. 33 issue that describes many climbers.

***Clematis aristata*:** A strongly growing, woody climber, trailing over small trees, bushes, logs and rocks. The leaves are usually trifoliate, on long stalks; the margins are entire or roughly toothed. When in flower this *Clematis* makes a fine show among the trees and shrubs of the forests in the less wetter areas. The flowers are borne on long stalks in clusters at the ends of the twining branches. They are without petals, 4-5 long white sepals constitute the showy portion of the flower. Male and female flowers are often to be found on separate plants. The seeds are like tiny feathers, and the wind is the dispersal agent.

This *Clematis* is very common on the Mainland as well as Tasmania, usually in fairly dry situations or occasionally on the margins of damp forests.

***Clematis microphylla*:** A woody climber very similar to *C. aristata* but somewhat smaller in all its parts and the anthers in *C. microphylla* do not possess a terminal appendage as in *C. aristata*.

It is quite common in the north of the State and on the Mainland.

***Parsonia straminea* (Lyonsia):** This strongly growing climber is quite common in Tasmania as well as in Vic. and N.S.W., favouring thickly wooded gulleys and slopes, becoming rampant and tending to smother the lesser shrubs and trees over a fairly large area. The flowers are rather inconspicuous and the fruits are not shed until the following flowering season. *Parsonia* is of limited value in a garden owing to its rampant habit of growth.

Comesperma volubile is another common plant in Tasmania and all Mainland States, climbing thickly and untidily into the surrounding low shrubs. Very conspicuous when flowering, at first sight the flowers en masse look like a puff of blue smoke. Superficially the flowers resemble those of the "Pea" family, though of course they are quite different. Very rarely a white form of this plant may be found. *Comesperma volubile* is easy to grow but unless it is given support it will choke and possibly kill a plant it climbs upon. Although its habit suggests otherwise it is not a parasite.

Billardiera longiflora and *B. scandens* have been fully described in *Australian Plants* No. 33.

***Hibbertia billardieri*:** A straggling plant, not strictly a climber, found throughout the whole of S.E. Australia usually in damp and fairly acid situations. The leaves are narrow, blunt and have slightly revolute margins. The flowers are similar to other common species of *Hibbertia* (stamens on one side of the ovary, deeply notched petals and two copiously hairy ovaries). A pleasing garden plant, easily grown from seed or cuttings and requiring pruning or alternatively a low shrub in close proximity, over which to straggle.

***Drosera planchonii*:** A peculiar plant, typical of the family *Droseraceae*. The leaves are modified organs, capable of trapping small insects and utilizing the nitrogenous compounds contained within. *D. planchonii* is a straggling plant, amongst the lower undergrowth, arising from a deeply planted bulb. Common in all S. and E. States.

Parasitic Plants: Two genera of plants containing climbing species may be included *Lauraceae*—*Cassytha glabella*; *C. melantha*; *C. pubescens*. *Convolvulaceae*—*Cuscuta tasmanica*. All plants with leaves absent or much reduced and possessing organs called Haustoria which penetrate the tissues of the host plant and obtain some of the nutrients necessary for survival,

A NATURAL POND FOR YOUR GARDEN

by L. K. Bates, Page St., Mareeba, Qld.

Five dollars 23 cents and buckets of perspiration—this was the total cost of providing something which greatly increased the area of interest of my garden, at the same time giving pleasure to many animals, *Homo sapiens* included. Let's ask some questions about providing an all-native pond for the garden.

WHY? Many people in Australia, myself included, like the idea of providing food and water to attract birds to the garden. I don't think I have any Scotch ancestors but I never could see the point in buying food if it could be provided free, and my natural laziness rather ruled out the idea of filling tins of water regularly. Thus a garden of nectar-producing and insect-attractive Australian plants (providing excellent food for a desirable and interesting group of native birds), fitted in perfectly with a self-help type of bush pond. And what garden would not look better with an area of water, supporting plant and animal life? Aesthetically a pond is of the greatest value.

WHERE? Depends, I suppose, on what sort of garden you've got. A garden could be designed round a pond, while for many, available area could be an important consideration. Mine is in a corner of the garden because I had to provide some sort of anti-children fence around it. Surface area is about that of an average room—I made sure it was large enough to support a fish and other water-animal population without any assistance from me—besides, I hate mowing. Those in a cane-toad area must provide a toad-proof fence if you are not to have polluted water (frogs are native and should give no trouble). But the most important aspect is HOW? I guess I was lucky. The rocks were already there in natural positions and my soil was a water-impervious clay so all I had to do was dig a hole. In another case a 3 inch layer of clay in the hole gave a good seal. I prefer a clay-lined pond, as in a natural set-up such as this, plants grow in the pond and bacterial action keeps the pond healthy. My pond water remains crystal-clear and is never touched. Note that rocks may sink through a clay lining and break the seal.

Water comes in via a float valve which keeps the level constant without attention. Pond averages about a foot in depth, two feet at deepest point (water reaches 97° in summer, but this doesn't seem to worry pond inhabitants). It is stocked entirely with local plants and animals: most important are small species of native fish which feed on insects and breed naturally; most Australian streams have some of these. Various species of water plants provide shelter and food for fish, tortoises, crayfish, water snails, and numerous water insects. This whole micro-environment is self-supporting and extremely interesting, virtually no maintenance being required. Anything non-native has been excluded to help maintain a natural balance.

Lastly we ask WHEN? Well, the sooner the better. My pond became self-supporting in a matter of months and soon brought in birds and insects. Various water-loving native plants, such as *Callistemon viminalis* and *Melaleuca* spp. are providing shelter and spring-boards for Honeyeaters, which love to dive into the water after doing a round of the garden. A pond soon becomes a source of great interest and satisfaction.

Editor's Note: Readers with experience in the use of ponds in their garden may care to provide notes for publication.

SOME LEPTOSPERMUMS FOR GARDEN

Our no. 30 issue introduced the "tea-trees", *Leptospermum*, as subjects for the garden. W. M. Martin of Melbourne, Victoria, has this to add concerning the local "tea-trees".

***Leptospermum ericoides*.** This tea-tree is one of rare ones that can be pruned heavily at any time. Makes a good spreading "standard". Naturally occurs as a large weeping form to 12 ft., and a magnificent sight in full bloom. Self-germinates readily.



Silky Tea Tree — *Leptospermum myrsinoides*

This tea-tree with its attractive variations in pink colouring is widespread in S.A., Vic. & N.S.W. Its natural hybrid with *L. laevigatum* was formerly described as *L. laevigatum* var. *minus* & *L. coriaceum*. The petals are almost transparent, the mature leaves are glabrous and concave, while the juvenile foliage is generally pubescent.



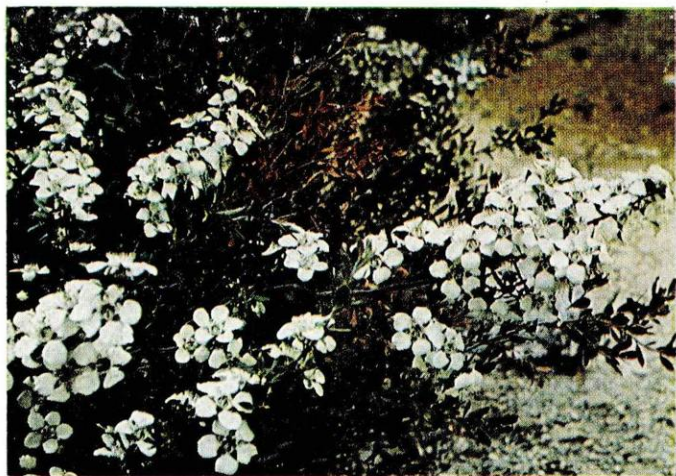
Blocks donated by N. B. Thomson.

Leptospermum nitidum

This is not a very good plant having been left to straggling on its own in the bush. Pruned after flowering however it can become an attractive garden shrub. Most tea-trees occur in well drained soils of the ranges and coast of the southern and eastern states. In contrast to their close relatives, the Melaleucas, they will not grow in waterlogged soils. They seem to flower best when left alone and watered only occasionally in very dry periods.

***Leptospermum squarrosum*.** One of the best. Large pink flowers along three-year-old wood, persistent for long period. Slow to establish from rooted cuttings, it is a fast grower in sand.

***Leptospermum nitidum macrocarpum*.** The shining bronze foliage is an attraction alone, without the enormous yellow-green flowers. This species has made a very good bonzai specimen.



Blocks donated by N. B. Thomson.

Leptospermum nitidum

This tea-tree has the largest flowers of our tea-trees except for a variety of *L. scoparium* and its own variety *macrocarpum*. The large fruits and clear white opaque petals easily identify this species in Victoria.

***Leptospermum juniperinum*.** The local form here grows to about 4 ft., and is a lovely sight for about five weeks. The clear white blooms with their dark centres are densely crowded up the stems. Easily propagated from seed.

***Leptospermum epacridoideum*.** Very attractive sparse grower to 8 ft. Tiny foliage and numerous small pink flowers. It is growing well in the Botanical Gardens, Melbourne. No success yet from cuttings or seed.

Most tea-trees require early and regular pruning as they do not have dormant buds on mature growth. With few exceptions they flower on new-season's growth.

Hypocalymma angustifolium

From J. DUFFEL, Campbell, A.C.T.

I have a plant of *Hypocalymma angustifolium* growing against the east wall of the house in friable loam of a good depth. The bed is not built up and has very little overhang from the roof, therefore the plant receives no protection from frost which can be severe—15° on grass was lowest last year—but it does not burn at all. It flowered well last spring after a year in the ground and is in full bud now (June). The situation is rather dry and I don't water it often even though we have only had 4½" of rain this year. I have given it no fertiliser and the plant is now 2 ft. 6 ins. high, and looking very healthy.

Editor's Note: The beautiful shrubs *Hypocalymma* were described in our No. 31 issue.

GREVILLEA I KNOW WITH TOOTH-BRUSH FLOWERS—continued from page 338

Grevillea steiglitziana though being confined to the central and southern end of the Brisbane Ranges, grows prolifically in this restricted area. A low growing shrub with deeply lobed leaves, this is another species which flourishes under garden conditions.

The Brisbane Ranges running north from above Geelong to Bacchus Marsh with its deep red sands produces a unique unity of plants. There are three grevillea growing in close association, *G. chrysophæa*, *G. parviflora*, a cascading form of *G. rosmarinifolia*, all having flowers in the single heads. These beautiful Grevilleas must be described more fully in future articles on Grevillea with flowers of this form.

Grevillea barklyana. I have left till last our one and only grevillea which can lay claim to growing anywhere near tree proportions. Restricted in Victoria, to the head waters of the Bunyip River in Gippsland, this variably foliaged species can reach a height of up to 20'. The leaves 6-8" long can be deeply lobed three to ten times or entire. Young foliage is attractive being bronzy red, while the pink flower is loosely held in a 4" long raceme. It also thrives in cultivation. A seedling we collected which was no longer than a match has attained a height of 8' in its second year in the garden. A form from Jervis Bay, N.S.W. has entire leaves.

THE ERECT CYLINDRICAL FLOWER-HEAD GREVILLEA

When the flowers are grouped in dense cylindrical heads to form a head of flower, usually erect, we come to another section of this very variable genus that to the layman has characteristic features. In some instances the beginner might confuse these with some of the "toothbrush-like" flower heads but examine the shape of the flowerheads on all parts of the shrub first.

Species with this form of flowerhead in Victoria are:

GREVILLEA WITH LEAVES HAVING JAGGED OR "SAW TOOTH" EDGES

Grevillea ramosissima grows on the north-east slope of Pine Mt. in N.E. Vic. It usually attains a height of 6-8 ft., a multitude of white flower spikes are held high on the bush while the leaves which are normally 3 ins. long and wide, are deeply divided into three segments each segment usually divided again into three. The leaves are bright green on the upper surface while the hairs on the underside are so appressed that it attains a striking silvery appearance. I have not had the opportunity of observing the Canberra form to note if any marked differences occur in this species but a recent sample sent to me of the form which occurs on the Warrumbungle Mts., N.S.W., had more deeply lobed and rigid foliage.

GREVILLEA WITH FINE NEEDLE-LIKE GREY FOLIAGE

Grevillea pterosperma grows in the arid northern Mallee of Victoria but also in South and Western Australia. The average height of a mature shrub is usually 8 to 10'. Long white flower spikes are prominent among the 5" long fine needle-like grey foliage.

Grevillea confertifolia is endemic to the Grampians, growing as a compact shrub at higher elevations. Its seed has apparently been dispersed by water action to lower regions, and we have observed it growing in permanent water in fast flowing creeks on the western slopes, the habit of the plant here being upright to 3' and rather straggly. The foliage is similar to *G. rosmarinifolia* but with shorter stiff, needle-like foliage. The flower of this particular occurrence is a delicate pink with racemes usually 1½" long.

GREVILLEA HYBRIDS! WHY NOT GOOD FORMS OF TRUE SPECIES

In closing I wish to express a feeling, which though being put into print by myself, is also the feeling of many of my close associates. We express alarm at the number of home bred hybrids which are finding their way into many commercial nurseries. In some cases their stock consists of up to 25% of these hybrids. *Grevillea*, because of its habit of hybridising relatively easily, being the most offered. It is felt that if the efforts expended by some growers in producing these plants was put to better use in conserving and propagating for distribution, good forms of species which face extinction in all parts of our nation, we may be able to leave for future generations a resemblance of what is a great heritage and unique flora.

Editor's Note: The genus *Grevillea* has about 250 species. So far I have not been able to find a botanist who will review the entire genus for us. It is such a valuable genus to the horticulturalist that we shall attempt to list and describe the species under which characters are readily discernible to the layman such as the shape of the flowerhead, inflorescence, leaf and bush habit. Earlier issues have described "Plume Grevilleas", the "Flame Cone Grevillea" and the "Red Poker Flowered Grevillea." See Vol. 3, No. 21 and Vol. 4, No. 29.

"TOOTHBRUSH" GREVILLEA FROM N.S.W.—continued from page 336

Grevillea laurifolia is a fairly common shrub, recorded from Lithgow, Mount Wilson, Katoomba, Valley Heights, and Wombeyan Caves district. There is a large specimen of this plant to be seen in the Canberra Botanic Gardens, a dense mat about eight feet in diameter. The leaves of *G. laurifolia* are about two inches in length and oval-shaped, rather leathery; but specimens from an area out from Wentworth Falls have leaves as large as the well known garden shrub *Magnolia soulangeana*, and, superficially alike. The colour of the flower of *Grevillea laurifolia* is red, and the habit of the shrub is prostrate.

Grevillea x gaudichaudii is a natural hybrid between the last two named species. This plant is well established in cultivation, and is used successfully as a cover plant where it is necessary to shelter the root systems of other plants. The "Toothbrush" flower is a purple-red, or more correctly a purple and red, for both colours are present in the unfolding flower. The leaves of this shrub are a bright shining green, not prickly, as with *Grevillea acanthifolia*, nor dull-covered, as is the case with older leaves of *Grevillea laurifolia*. The leaves are deeply cut, but not as fine as with *Grevillea acanthifolia*, and they may have rounded or pointed edges. As a rule this is a prostrate shrub, but some forms are upright, others again try to rise up in the world. But, all told, whatever its form, a very desirable garden shrub, although, at times it may be hard to tell Gaudi from Chaudii!

Grevillea caleyi would be the easiest of the "Toothbrush" Grevilleas to be seen growing naturally; for it occurs on either side of Mona Vale Road beyond Terrey Hills, N.S.W., in an easterly direction. It is quite common for instance around the BAHAI Temple, at Ingleside. It has deeply-cut leaves and the juvenile leaves are very attractive: soft to the touch and pink coloured. Older plants however have very long arching branches, and the softness of the younger plants is missing. The colour of the flowers is pink to red. Some years ago a bush fire in the area caused hundreds of seedlings to grow up, which seems to indicate that the seeds develop a hard testa when exposed to the atmosphere, as freshly sown seeds germinate freely. Vigilant pruning should keep this fine shrub in control, but prospective gardeners should take a drive along Mona Vale Road before allotting a place for this shrub in a suburban garden.

These then are the better known "Toothbrush" *Grevilleas* in N.S.W., and in a way form a little group. Are there any others? Well, it is not claimed that these are the only "Toothbrush *Grevilleas*" in this state. Indeed one has only to look across from Dural, for instance, at the vastness of the Blue Mountains and speculate on what botanical treasure may be still hidden away there. And if this dream needs support one can recall that *Grevillea shiressii* grows, not so far away, in one gully only in the Hawkesbury River area, and this is, more or less, still Sydney.

In conclusion may I thank Mr. D. McGillivray, botanist, at the Royal Botanical Gardens, Sydney, for assistance with these notes, both botanical and geographical.

THE CASE OF GARDENERS v. SLATERS

by W. M. Martin

Clerk of Court: "Calling Mr. Sidney Slater—will you please take the stand. You are charged with loitering with intent to nibble Mr. Martin's seedlings. How do you plead?"

Sid Slater: "Not guilty, Sir!"

Prosecutor: "Your Honour, we intend to show that this individual and all his family are dastardly predators of plant life, and fully deserve the deadly measures advocated over the years by garden-magazine writers. Mr. Slater, we have here the statements of many writers accusing you of eating garden plants, and advising gardeners to take elaborate and expensive measures to evict you from your residence in rubbish heaps and garden beds. Are you accusing these people of lying?"

Sid Slater: "No Sir, but they are just perpetuating an ancient myth, and perhaps they are paid by pesticide firms to accuse us. We are saphrophytes!"

Prosecutor: "What is a safro - - -? What did you call yourself?"

Sid Slater: "A saphrophyte Sir—we like to eat nice juicy decaying organic material—there's just nothing quite so nice, Sir."

Prosecutor: "If that is so, why were you caught prowling around in Mr. Martin's glasshouse bench among his seedlings?"

Sid Slater: "My relatives and I all live there. It's cosy, damp and warm in there; and our enemies can't get us. We pinch a little of Mr. Martin's patting mix sometimes; but there is plenty of our favourite tucker around outside."

Prosecutor: "He's obviously lying your Honour. All these writers can't be wrong."

Judge: "Is that the case for the prosecution?"

Prosecutor: "Yes your Honour."

Judge: "Call first witness for defence."

Sid Slater: "Your Honour, my only witness is Mr. Martin, who has kindly come along today to speak on my behalf."

Mr. Martin: "Well Sir, I have had many of Mr. Slater's ancestors living in my glasshouse for years, and I have never seen any harm which could have been done by them. I have hundreds of cuttings and seedlings in there every year, and they all remain unharmed. As far as I am concerned, he's welcome to live there indefinitely."

Judge: "In view of the lack of evidence against the accused, the case is dismissed."

THRYPTOMENE

MYRTACEAE FOR S.A. GARDENS by I. G. Holliday. In our no. 30 issue this author describes other plants for S.A. gardens including *Baeckea*, *Hypocalymma* and *Leptospermum*.

The genus *Thryptomene* contains some of Australia's best dwarf shrubs. Often the flowering season lasts from 3-6 months from autumn to spring.

The following species from West Australia are recommended.

Thryptomene baeckeacea is an extremely floriferous small shrub from the Murchison River area of Western Australia. Flowers are deep pink and massed throughout winter and early spring. It does well in Adelaide at least in non-alkaline prepared soils.

Thryptomene hyporhytes is another very dainty Western Australian dwarf shrub with pink flowers, and requiring similar conditions to the preceding.

Thryptomene saxicola from Western Australia and the improved form known as "Payne's hybrid" are dense, winter flowering shrubs with pale pink flowers. The hybrid form tolerates dry conditions but requires non-alkaline soils for best results.

The three species native to South Australia are rarely cultivated.

Thryptomene elliottii is an attractive white flowered shrub from the dry inland which favours sandy soils.

Thryptomene miqueliana from Eyre Peninsula, as well as Victoria and New South Wales, and *Thryptomene ericaea* also from Eyre Peninsula and Kangaroo Island, are very similar to *T. calycina*. *T. miqueliana* is easily distinguished by its rather unpleasant odour. This species grows well on limestone soils.

Thryptomene maisonneuvii from the inland, is not cultivated in this State.



Block donated by N. B. Thomson

GRAMPIANS HEATH MYRTLE—*Thryptomene calycina*

A wildflower found only in the Grampians of western Victoria. It is cultivated for the market in springtime and sold in enormous quantities as a "cut flower" for indoor decoration. The small flowers are shown clearly in a close-up colour plate in our No. 30 issue. The growth habit of most species is similar to that above and the introduction of some species from Western Australia would create quite a stir in the horticultural trade.

MULTI-FLOWERED PTEROSTYLIS—continued from page 349

THE SPECIES (arranged alphabetically)

Pterostylis boormanii Rupp.: One of the "rufous" group, occurring on the Central Western Slopes on rocky ridges, outcrops and hillsides in crevices filled with leaf-mould, or beneath Cypress Pines in a similar locality. Flowers are translucent reddish-brown with clear patches, 2-7 on the stem. The short "whiskers" on the edges of the lateral sepals are an added attraction. It is not common to find all flowers on the stem open at the one time. Usually, two are open, with others in bud and some withering.

Flowering: Oct.-Nov.

Some localities: Cookamidgera, Grenfell, Jemalong, Trundle.

Pterostylis cynocephala FitzG. "Swan's Head Greenhood": The common name refers to the rather small labellum appendage which is supposed to resemble a swan's head. Flowers are small, green, up to 15 in number on a stout stem. Found mostly in undisturbed grassland or light forest, but does not appear to be as widespread as *P. mutica*, to which it is closely related. When found in the wild, *P. cynocephala* can occur purely in relatively large numbers, or sometimes mixed with *P. mutica*.

Flowering: Sept.-Oct. Some localities: Bathurst, Tamworth, Eugowra.

Pterostylis longifolia R.Br. There appear to be two visually distinct forms.

- (a) Coastal form with slender stem, narrow stem leaves, pale green and more angular galea. Occurs in coastal forest in sheltered situations.
- (b) Inland form with stout stems, broader stem leaves, dark green/light green striped galea. Flowers generally larger than above, and on stouter pedicels. Occurs in sheltered damp areas on undisturbed hillsides and sometimes among grass in or near forest areas. Flowers 1-7 in number, but mostly 2-5. Flowering: May-Sept. Colour plate pp. 348.

Some localities: Mt. Kembla, Karuah, Tuggerah, Cowra, Newcastle.

Pterostylis gibbosa ssp. *mittelli* (Lindl.) Blackmore et Clemesha. Very restricted in distribution. It is another of the "rufous" group, with flowers or translucent pale red, green and transparent patches. It seems to prefer dry forest east of the Dividing Range. Scattered plants may be found in the shelter of native grasses, or sometimes in more open situations. Flowers number 2 to about 5.

Flowering: Sept.-Oct. Locality: Weston.

Pterostylis mutica R.Br.: A rather widespread species with numerous small green flowers, differing from *P. cynocephala* in the absence of the swan's head shaped labellum appendage. This is the only species of the group which I have had in cultivation which has shown indefinite evidence of vegetative reproduction under conditions of cultivation, and even in this species this occurrence is not common. The plant flowers and seeds freely when cultivated.

The habitat of the plant is mainly dampish areas in Eucalypt forest, grassland, and, inland, in the flatter areas leading up to ridges in Cypress Pine forest, and sometimes in very flat country near creeks or sheltering near fallen logs. Flowers 2-18.

Flowering: July-October.

Some localities: Dapto, Weston, Eugowra, Parkes.

Pterostylis parviflora R.Br. "Baby Greenhood": This is another species of which two distinct forms can be found.

- (a) A tall stout stemmed plant with larger flowers which contain more traces of red.

(b) The more slender, usually shorter plant with smaller pale green flowers.

This plant, unlike others mentioned so far, produces its flowering stem before the rosette appears. It is common for robust forms to produce 2-3 rosettes from the one tuber, around the base of the stem which has just flowered. Plants can be found in coastal areas in heath country and low scrub, and inland, near creeks or other areas of drainage in light forest. Inland heaths can also contain plants of *P. parviflora*.

Cultivation of the species appears particularly difficult to date. Tubers may remain 2-3 years, then disappear suddenly. Vegetative reproduction in cultivation, and as far as I know, in the wild, is not known, and the plant probably reproduces solely from seed. Flowers 1-7.

Some localities: Grenfell, Bindogandri, Grudgery, Bathurst, Blue Mts., Jamberoo. Flowering: Jan.-June.

Pterostylis rufa R.Br. ssp. *rufa*. The glowing red flowers on stout pedicels make this an outstanding plant. The flowers are usually not held erect on the pedicels, but protrude at an angle to the stem and are well separated. The habitat of the plant is as for *P. mutica*, but it does not seem to extend so far inland. Flowers 2-9.

Flowering: Mainly Oct. Some localities: Dapto, Weston.

Pterostylis rufa R.Br. ssp. *aciculiformis* (Nicholls) Blackmore et Clemesha. One of the "rufous" group, with translucent red and green flowers smaller than others of the group. It appears to favour the drier areas of the state, and inland is found among Cypress Pine on ridges and hillsides. Some forms are short and diminutive, others tall and relatively robust. The classification of this species and the following variety is not very clear. Flowers 2-8.

Flowering: Mainly Oct.

Some localities: Coonabarabran, Nangor, Rockly Mt.

Pterostylis hamata Blackmore et Clemesha. This plant is a distinct, stout member of the "rufous" group which can readily be distinguished from other members by the ends of the lateral sepals being formed into a pronounced upward curve. Flowers can be greenish, or more commonly translucent pale brown. The plant occurs in the Central West of N.S.W. and like other members of the group favours rocky ridges and higher elevations, especially flat hilltops with little ground cover in the way of plants, but with a deep layer of rotting tree leaves. In suitable locations, rosettes can be massive, up to 5" across. Humus filled rock crevices are also a favourite home for the plant. This species and *P. boormanii*, which sometimes occur together, appear to show a distinct preference for the kind of shelter and leaf litter produced by mature trees of *Acacia doratoxylon*. In some areas where I have seen the plants growing, the mid-summer temperature, when the plant is dormant, must be extremely high. Tubers are usually large. Flowers 2-8.

Flowering: Oct.-Nov. Some localities: Cowra, Grenfell.

Pterostylis woollsi FitzG.: Descriptions of the plant always contain reference to the striking nature of the plant, and this short description is no exception. In addition to a stout, tall stem, the lateral sepals are extended into fine points up to 15 cm. The flowers, green or pale brown in colour, are held widely spaced and the irritable labellum is very prominent when in the "set" position. Another member of the "rufous" group.

The plant grows in sheltered situations on rocky or stony hillsides and tops, where there is an assured supply of dampness. It can be found sparingly in the Central West and in the Northern Tablelands. Flowers 1-4.

Flowering: Oct.-Dec. Some localities: Cowra, Moonbi.

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GREENHOODS OF BICHENO

by Brian Alford, New Norfolk, Tasmania

Bicheno, on Tasmania's East Coast, with its mild round-the-year climate, is a haven for native orchids. Of the 23 Tasmanian genera, species from at least 20 are found here.

The Greenhoods, like green-cowled monks, make an impressive showing with thirteen species represented. From the robust Blunt Greenhood, *Pterostylis curta*, to the diminutive Dwarf Greenhood, *P. nana*, they show interesting variations in appearance and in the shape of the labellum or "tongue". The Bearded Greenhood, *P. barbata*, has a thread-like labellum covered in short yellow hairs and because of its protruding nature is somewhat reminiscent of a child showing his displeasure. The Tall Greenhood, *P. longifolia* has a very irritable labellum flying back into the hood when touched but cautiously resetting itself when the intruder has departed.

The Trim Greenhood, *P. concinna*, is very common in the area and is closely associated with the less common striped Greenhood, *P. alata*. It is worthy of note that the Mentone Greenhood, *P. toveyana*, has not been found here. This orchid was presumed to be a natural hybrid between *P. concinna* and *P. alata*. Leonard Rodway (1903) recorded that "when *P. concinna* lives with *P. praecox* (that is, *P. alata*), hybridization is common." If this is so then further searching in the area may well be rewarded.

The Superb Greenhood, *P. grandiflora*, resembles a cobra about to strike with its large erect head and wide brown "wings" on both sides of the hood. This orchid is not plentiful in the area and in this respect resembles the Tailed Greenhood, *P. pedaglossa*, which occurs in swampy habitats and is easily overlooked because of its ability to blend in with the surrounding vegetation.

Three Greenhoods showing altitude zoning very well in this area are the Summer Greenhood, *P. decurva*, the Maroon Greenhood, *P. pedunculata* and the Swan Greenhood, *P. cynocephala*. The former is confined to the higher areas, the second to well drained slopes and the last orchid to sand dune areas.

The last two species present are the Nodding Greenhood, *P. nutans*, with its large, bloated, nodding head and the Tiny Greenhood, *P. parviflora*. This orchid is peculiar because of its rather long flowering season and the orientation of its flower heads, usually two in number and facing each other. South of Bicheno, a swamp form of this orchid may well prove to be *P. aphylla*, perhaps confused for several years as being a variety of *P. parviflora*.

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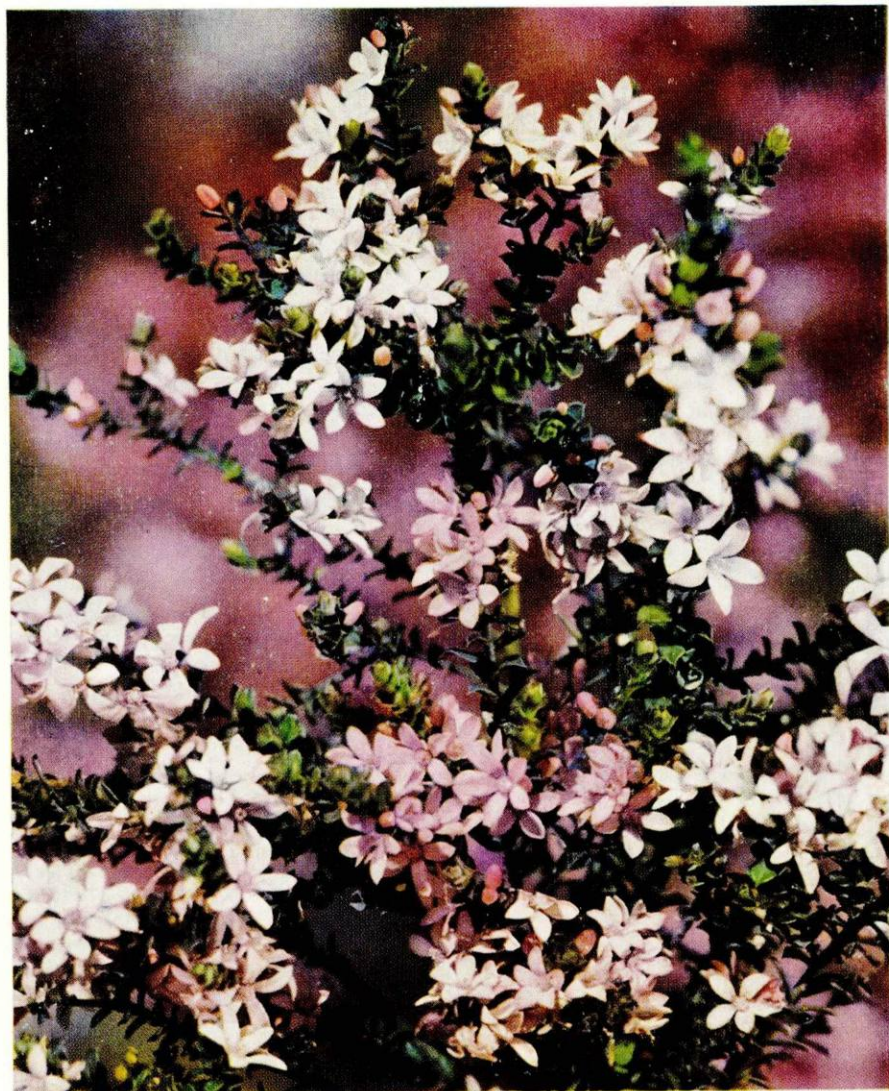
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