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Colour Photography, F. W. Humphries

PIMELEA SUAVEOLENS

The "Scented Banjine", *P. suaveolens*, comes from the Darling Ranges, W.A. Flowering in winter and early spring, the fragrant lemon-yellow flowers, with orange coloured anthers make this plant a prized garden subject.

HOW TO GROW NATIVE PIMELEA—See over

<i>P. petraea</i>	181
<i>P. petrophilla</i>	183
<i>P. phylicoides</i>	184
<i>P. physodes</i> 147, 163, 165,	184
166, 180	
<i>P. preissii</i>	187
<i>P. punicea</i>	166
<i>P. pygmaea</i>	162, 183
<i>P. rosea</i> 147, 156, 158, 159,	187
162, 163, 164, 167	
<i>P. sanguinea</i>	167
<i>P. sericea</i>	160, 181
<i>F. sericoestachya</i>	182
<i>P. serpyllifolia</i> 159, 160, 183	
<i>P. shuttleworthiana</i> syn.	182
<i>P. argeata</i>	182
<i>P. simplex</i>	180, 182
<i>P. spathulata</i>	148, 167
<i>P. spectabilis</i>	162, 182
<i>P. spicata</i>	187
<i>P. spiculigera</i>	182
<i>P. stricta</i>	157, 187
<i>P. suaveolens</i> 145, 147, 156,	180
159, 163, 180	
<i>P. sulphurea</i> 163, 179,	180
<i>P. sylvestris</i> 163, 179,	180
<i>P. tenuis</i>	180
<i>P. thesioides</i>	184
<i>P. treypaudii</i>	181
<i>P. trichostachya</i>	182
<i>P. umbricata</i>	181
<i>P. villifera</i>	181
<i>P. williamsontii</i>	182

"AUSTRALIAN PLANTS"—Vol. 2 and "The Descriptive Catalogue of West Australian Plants" will not be available until early October.

PIMELEA

by FRANK WOOD

Pimeleas, or Rice-flowers, belong to the family *Thymelaeaceae* of which the popular garden daphne is a well known representative. The relationship is apparent in such species as *Pimelea rosea*, but in the Qualup Bell etc., the true flowers are hidden by the large leafy bracts which form a protective cup. Apart from 15 species in New Zealand the genus *Pimelea* is almost exclusively Australian (almost 80 species), and many of the species are rather difficult to discriminate. Most are erect evergreen shrubs, but a few are prostrate, or semi-prostrate, with opposite or alternate leaves, or both. The chief characters of the reproductive parts are . . . terminal or axillary flowers, white, yellow, pink or red; perianth single, tubular, four-lobed; stamens two; fruit dry or pulpy. The botanical name comes from "pimele" meaning fat, and refers to the oily seeds.

All species of *Pimelea* are comparatively short lived, but most are well worth growing under suitable garden conditions. Plants are readily increased by seed or cuttings, the latter method being the best means of renewal in most cases. Pimeleas enjoy a light free soil, with absence of lime, full sun but protection from heavy frosts.

Of the 80 odd Australian species, a few species have been accepted garden plants for a long time, and I propose to deal with these first, as they stand out from the main body in the minds of horticulturalists. However, there are many more just as good, and these would reward the efforts of enterprising gardeners.

PIMELEA FROM WESTERN AUSTRALIA

Pimelea ferruginea, undoubtedly the best known of all, is an erect shrub to 2 feet in height, with oblong-elliptical shining green and closely placed leaves. It flowers freely in spring with rose coloured flowers in heads 1½" across, and has long been a popular glass-house plant in Britain and America. It always seems to me to resemble a rather neat box-leaf *Veronica*. Bushes should be well pruned after spring flowering. Colour Pl. p. 164.

Pimelea rosea is a pretty little shrub, with silky hairy pink flowers and slender stems sparsely covered with small, narrow leaves. A little gem. A colour plate appears on page 100 of our No. 23 issue. The flower is very similar to *Pimelea ferruginea*, but with a fringe of hair on the more acute bracts.

Pimelea suaveolens, the "Scented Banjine," is a common species of the Darling Ranges, found between Perth and Albany and flowers in winter and early spring. The fragrant lemon-yellow flowers, with orange coloured anthers, form drooping heads with silky green bracts. It grows to a height of approximately 3'. Colour Plate on front cover.

Pimelea physodes, the "Qualup Bell," is one of the outstanding wild flowers of Western Australia. The flower heads form graceful nodding bells and the enclosing, overlapping bracts have a lovely autumn tint. The perfume is considered by some to be more delicate than *Boronia*. It is a handsome small shrub, 2 feet or so in height, with the colour of the bracts varying from purple through to apple green. More people are growing

this rewarding shrub every year. In nature it has a limited range of distribution, being found on gravelly soils between Ravensthorpe and the Gardener River, W.A., and occurring abundantly near the old Qualup Homestead.

Pimelea clavata, a tree or large shrub species of the Karri Forest, is said to have bark tough enough to tether horses. According to C. A. Gardner it has very small flowers, yellowish-white in colour, and is known as the "Club flowered Rice-flower." Quite a few gardeners have grown it as a novelty. It grows to a height of 10 feet.

Pimelea spectabilis, an overseas favourite, is another fine shrub attaining a height of 4 feet and producing crowded flower heads varying from creamy-white to rich pink in colour and about 2" to 3" in width. The tubes and lobes of the flowers are covered in minute hairs.



Colour photography by F. W. Humphries

PIMELEA SPECTABILIS

This species from the Darling Ranges is worth a place in the garden. The shrub grows erect, to 4 feet or more tall, the leaves are glabrous, lanceolate about 1 inch long. The involucre bracts 4-6 are about $\frac{1}{2}$ inch long ovate-lanceolate in shape. The creamy, pink-tinged flowerheads are up to $1\frac{1}{4}$ inches in diameter. The large size of the globular flower heads makes this a very attractive garden plant. It does well in cultivation—E. Wittwer.

PIMELEA FROM EASTERN AUSTRALIA

Most of the Eastern species have white or yellow flowers.

Pimelea ligustrina, "Tall or Privet Rice-flower," is one of the best, in my experience, for response to cultivation. It is an ornamental species having dense hemispherical clusters of white flowers, often 1" wide, that nod at branch ends. Leaves dark green, 2" long and $\frac{1}{2}$ " wide. Bracts 4-6. It grows to a height of 5' to 8' and flowers in summer. N.S.W., Vic., Tas., S.A. (where rare). In N.S.W. it occurs on the tableland and south coast,



Colour photography by D. Baglin. Reproduced from "The Alpine Flowers of the Kosciusko State Park" by courtesy of The K. G. Murray Publishing Co. Pty Ltd. and The Kosciusko State Park Trust.

PIMELEA LIGUSTRINA

Reports by stockmen last century of a "Kosciusko Rose" puzzled botanists until it was discovered that *Pimelea ligustrina* was the plant, its clusters of flowers having a vague resemblance to the banksia rose.

flowering October-January. See species listing for three other varieties to the type.

Pimelea linifolia (syn. *P. involocrata*), "Flax-leaf or Nodding, sometimes Slender Rice-flower," has for many years been cultivated overseas as a pot plant and is a beautiful species with showy pinkish-white flowers and yellow stamens. Leaves are narrow and under 1" long. It prefers sandy soil and makes a bush of from 1' to 3'. Native to Queensland, Victoria, New South Wales, Tasmania. It is widespread in N.S.W., flowering mainly in August-December with occasional flowers over much wider periods.

There is considerable difficulty (even for botanists) in distinguishing *P. colorans* and *P. spathulata* from *P. linifolia*. One authority is prepared to include all three under the one name, *P. linifolia*.

Pimelea axiflora, "Boot-lace Bush," has slender arching branches clothed with very narrow light green leaves and small clusters of creamy-white flowers close against the stem. It grows to a height of 10 feet and flowers in the spring. In the old bush days, strips of tough bark were used for tying up parcels, and even used as bootlaces by isolated settlers. N.S.W. (S. Coast), Vic., King Id., flowering August-October.

Pimelea axiflora* var. *alpina. "A low shrub with very small ovate conisecous leaves usually under ½" long." (Bentham). N.S.W. (S. T'lands.), Vic., flowering December-January.

Pimelea octophylla, "Downy Rice-flower," has been grown quite extensively in gardens. It is an attractive slender plant covered in white woolly down, and has fragrant cream flowers which are at their best during spring and summer. It grows to a height of 2 feet. Vic., S.A.

Pimelea alpina, "Alpine Rice-flower", is a rather unusual species of the sub-alpine woodlands and high mountain heaths; the rosy-pink flowers are highly decorative. There is also a white form. It is a much branched, prostrate or occasionally erect shrub to a height of 3 feet, glabrous or nearly so except for the inflorescence. Leaves oblong or oblong lanceolate, opposite and crowded on flowering branches. N.S.W., Vic., flowering December-January.

Pimelea haematostachya, the Queensland species known as "Red-hot Poker" is unique by reason of its blood-red flowers in spikes. This is a really magnificent plant, 1'-2' high; I shall never forget a vase of it at one of our early shows in the Melbourne Town Hall, contrasting with another of *P. spectabilis*, against a background of Coral Gum. Unfortunately the species is highly toxic to sheep.

Pimelea nivea, a free flowering Tasmanian species, is recommended by a very enthusiastic plantsman, Mr. A. L. Hargrave of Camberwell. It grows to a height of 4 feet and appears to be a very suitable garden subject, unusual in having a close mantle of white felt on the branches and undersides of the leaves.

These species virtually exhaust those that are grown in gardens in Melbourne to any extent. However, there are many more interesting kinds well worthy of a trial. Looking speculatively over the field, one could pick out a few well worthy of attention.

Continued on page 166 where following propagation hints, all the Australian species are listed and briefly described.

WESTERN PIMELEA

PIMELEA SPECIES FROM THE ONGERUP AREA by KEN NEWBEY

In the area under review several species of *Pimelea* are found growing on the loams, sands and sometimes loamy clays. They are not a dominant group but are often present on the soil types mentioned above. They normally grow from 1' to 3' as well-shaped, open shrubs, or open straggly plants. Plants which exceed 3' in height are often forced to by their environment.

The stems are usually willowy, covered with very strong bark which is difficult to break. For this reason it is advisable to use secateurs when pruning or cutting flower heads. Leaves are generally linear or ovate in shape, leathery in appearance, under 1" in length, opposite or alternate and in varying shades of green or blue-green. The involucral bracts are often deltoid in shape and the same texture and colour as the leaves. In a few species they are larger, giving the flower heads a bell shaped appearance, and as they persist for up to a month after flowering, they lengthen the apparent flowering period of that species. Flower heads vary in colour from white through yellow to deep pinks. The smaller flower heads are mostly upright with the larger ones becoming pendulous. Individual flowers vary in number from a few to about a hundred per flower head, depending on the species. The plants have long, vigorous tap roots in common with most of the lower rainfall flora. Young seedlings under 3" in height often have a tap root in excess of 15".

All species described in this article (with one exception) are worthy of cultivation with some being outstanding. They prefer well drained positions as most live in 14"-18" rainfall area on plain country which is generally well drained. As they have strong stems and deep tap roots they can be grown in exposed situations. In their natural state, grazing by stock helps to produce better shaped and denser plants. Pruning under cultivation should have a similar effect and if done after flowering would serve another purpose. As flower heads die, they become a dirty colour and should be removed. Cut flowers will last for up to 2 weeks or more inside. Most species flower from August to November, but a few flower spasmodically till February.

The *Pimelea* species appear to be both disease and insect free in their natural habitat. The only insect I have consistently observed on them is a harmless species of "hay" spider, light yellow in colour, which lives inside the "bell" of the Qualup Bell. In common with most of the flora in the Ongerup area, only a couple of the species have common names. Most are known simply as Rice Plants, with no distinguishing name for each species.

Of the approximately 19 species known or anticipated to grow within the Ongerup area, 16 are listed in alphabetical order. Species have only been divided into forms where there is a reasonable difference within the species. The species I have not yet found are *Pimelea clavata*, *P. eyrei* and *P. spectabilis*.

PIMELEA ANGUSTIFOLIA

White form: Grows as a low shrub in coarse sandy soil in 14"-18" rainfall. The plant branches from ground level to form a dome-shaped shrub of 2' or under. The leaves are linear, up to ¾" long, flat, leathery and

EPACRIDACEAE—THE AUSTRALIAN HEATHS

The next issue will feature the family *Epacridaceae* and the genus *Epacris*. As has become my practice a colour plate of an *Epacris* species is included below in the hope that it will inspire the reader to take up pen and advise the Editor their experiences in growing these showy little plants. Such species as *Epacris impressa*, the floral emblem of Victoria, and *Epacris longiflora*, the red *Epacris* of N.S.W., and other eastern States are quite well known and much sought after. Please help the Editor to produce your publication, *Australian Plants*.



Colour photograph by D. Baglin. Reproduced from "The Alpine Flowers of the Kosciusko State Park" by courtesy of The K. G. Murray Publishing Co. Pty. Ltd. and The Kosciusko State Park Trust.

EPACRIS SERPYLLIFOLIA—THYME HEATH

The mountain heaths, of which there are more than half a dozen species in the Snowy Mountains, generally grow in damp and infertile situations. The thyme heath, a small shrub about one foot high, can be distinguished by its small, pointed, stem-clasping leaves. Its white flowers are sweet-scented, and the foliage turns red in autumn.

dull green in colour. Involucral bracts are green, small, heart shaped and 4 in number. Flower heads are small, $\frac{1}{2}$ " to $\frac{3}{4}$ " across, white to cream in colour, mainly held upright but sometimes inclined to be slightly pendulous.

Pink form: Similar to the above but differs in being a more open shrub, flower heads are small with fewer flowers and pink in colour.

Both forms are worthy of cultivation where the white form could be used as a border plant and both forms as individual specimens. Sept.-Nov.

PIMELEA ARGENTEA

Inland form: This unusual *Pimelea* grows as an open, upright shrub to a height of 3' in coarse sands or loams in 15" rainfall. The leaves are about $\frac{1}{2}$ " long by $\frac{3}{16}$ " wide, silky, light green in colour, opposite and fairly close together. The flowers are very small, without involucral bracts, forming very small axillary flower clusters.

Coastal form: Similar habit to the inland form but the leaves are longer (up to $\frac{3}{4}$ "), silky grey in colour, closer together and the flowers are larger.

Both forms flower July-November. Neither form would be much use in cultivation. The inland form sometimes becomes a nuisance in some wheat growing areas where it periodically grows profusely. It is known locally as Shepherd Bush.



P. angustifolia

P. argentea

P. brachyphylla

P. brevifolia

PIMELEA BRACHYPHYLLA

A low, more or less upright plant to 12", found in sands, coarse loams and sometimes grey clays in 14" rainfall. Leaves are linear, $\frac{1}{4}$ " in length with margin recurved and the points slightly hooked. They are green or blue-green in colour and are sometimes borne fairly close together on the stems. Involucral bracts are the same colour as the leaves, 4 in number, elliptical in shape with a broad base and are $\frac{1}{4}$ " in length. Flower heads are white or slightly pink in colour, terminal and $\frac{1}{2}$ " across. Aug.-Oct.

An outstanding small species which could be well used as a border plant or for massed effect. Germinates well after fires in its natural habitat.

PIMELEA BREVIFOLIA

An outstanding, low, fairly dense shrub to 3' found growing in soils ranging from gravelly to sandy loams in 13"-20" rainfall. The leaves are small, linear, $\frac{1}{4}$ " to $\frac{1}{2}$ " long and light green in colour. Involucral bracts are green, heart shaped, about $\frac{1}{4}$ " long and 4 in number. Flower heads are under 1" across, white in colour and borne in profusion.

Due to its good dome-shaped habit and abundance of flowers in September-October, this species would make an excellent garden subject. It is very similar to the white form of *P. angustifolia* from which it has small botanical differences.



P. ferruginea

P. hispida

P. imbricata

P. lehmanniana

PIMELEA HISPIDA

Found in wet, sandy soils in 30" to 40" rainfall where it grows as a very open, upright shrub to 2' 6". Leaves are elliptical, up to 1" in length, dark green in colour, smooth and leathery in appearance. Involucral bracts are the same colour as the leaves, elliptical but broad at the base and $\frac{3}{8}$ " long. Flower heads are terminal, about $\frac{3}{4}$ " across, near white in colour and not very numerous. Flowers August-March.

This species should do well in wet places in the garden and under cultivation should develop into a good specimen plant.

PIMELEA IMBRICATA

A low, dense dome shaped shrub to 10" found growing in sand in 14" rainfall. The leaves are linear, about $\frac{1}{4}$ " long, very soft, covered with fine hairs, light to medium, green in colour and growing fairly close together. Involucral bracts are similar to the leaves in shape and texture but are nearly $\frac{1}{2}$ " in length, and number 9 or 10 per flower head. The flower heads are terminal, more or less upright, about $\frac{5}{8}$ " across, dense, cream-white in

colour and borne in profusion so as to completely cover the plant when in full flower. Flowers September-November.

Ideal as a border or single specimen plant.

PIMELEA LEHMANNIANA

Growing in sand in 20" rainfall, this species forms an open type of shrub to 3'. Leaves are linear, up to 1" in length, leathery and light green in colour. Involucral bracts are lanceolate, 4 in number, about $\frac{5}{8}$ " in length, light green turning to light red in the centre. Flower heads are terminal, more or less pendulous, over 1" across and yellow in colour. Flowers July-October. An outstanding specimen plant.

PIMELEA LONGIFLORA

Found growing in sand in 20" to 30" rainfall where it forms a very open shrub to 3'. Leaves are linear, up to $\frac{5}{8}$ " long, smooth and green in colour. Involucral bracts are similar to the leaves and are 4 in number. Flower heads are up to 1" across, inclined to be open, light yellow in colour and sometimes slightly pendulous. Flowers September-January.

Grown under cultivation, this species would most likely form a well shaped shrub.



P. longiflora

P. maxwellii

P. nervosa

P. physodes

PIMELEA MAXWELLII

A very open type of shrub to 2' high found growing in sand in 20" rainfall. Leaves are linear, up to $\frac{5}{8}$ " long, and dark green in colour. Involucral bracts are lanceolate, slightly over $\frac{1}{4}$ " in length, 4 in number and light green in colour. Flower heads are terminal, about $\frac{3}{4}$ " across and white in colour.

With pruning under cultivation, this species should form a good shaped, fairly dense shrub covered with flowers September and October. In its natural habitat, this species carries a large number of flowers in relation to the number of branches.

PIMELEA NERVOSA

This species is to be found growing in coarse sands or loams in 14" rainfall where it may reach 3' in height. The main stem usually reaches 1'

in height where it branches into a very open type of shrub. Leaves are narrow linear, up to $\frac{3}{4}$ " long and blue-green in colour. Involucral bracts are similar to the leaves in shape and colour, $\frac{1}{2}$ " in length and from 6 to 8 in number. Flower heads are terminal, up to $\frac{3}{4}$ " across, white and fairly dense.

PIMELEA PHYSODES—see page 165

PIMELEA ROSEA

Pink form: An upright plant to 4', found growing in sand in 20" to 30" rainfall. The leaves are linear, up to $\frac{3}{4}$ " in length, smooth and light green in colour. Involucral bracts are deltoid, $\frac{3}{8}$ " long and being light green at the base with margins shading through to light red in the centre. Flower heads are upright up to $1\frac{1}{4}$ " across and varying in colour from light to deep pink.

White form: Grows as a better shaped shrub to 2' in 15" rainfall. Differs from the pink form in the leaves being longer (up to 1"), involucral bracts are light green and $\frac{3}{8}$ " in length, flower heads are near white or very light pink, smaller and more dense. Both forms flower August-November.

Both forms are well worthy of cultivation with the pink form being better suited to wet conditions and the white form to exposed conditions.

PIMELEA SUAVEOLENS

Open form: Found on very old granitic soils where it grows as a very open shrub to 3' in 14"-16" rainfall. It has a main stem to 12" and then forms an open umbrella shaped top. Leaves are ovate, varying from $\frac{3}{8}$ " to $\frac{3}{4}$ " in length and are smooth. The young leaves are dark green in colour, becoming light green with age. Involucral bracts are similar to the leaves but are slightly larger and lighter in colour. Flower heads are less than 1" across, pendulous, and yellow in colour.

Dense form: Differs from the open form in that it forms a more closely branched shrub with larger flowers in excess of 1" in diameter. Both forms flower June-October.



P. rosea

P. suaveolens

P. sylvestris

P. sulphurea

Continued on page 164

EASTERN PIMELEA

SOME EASTERN PIMELEA SPECIES by JEAN GALBRAITH

SOME DWARF RICE-FLOWERS

Two delightful little dwarf species of *Pimelea* which would be attractive in a rock garden or the front of a border, are *Pimelea glauca* and *P. humilis*. Both are low bushes with a "pom-pom" of white flowers above a collar of four green bracts. They have a long flowering period and are quite covered with bloom in spring.

Pimelea glauca, "Smooth Rice-flower", is a little taller than *P. humilis* and has bracts noticeably broader than the leaves. Those of *P. humilis* are the same size as the leaves.

Pimelea humilis, "Dwarf Rice-flower", always a very dwarf spreading undershrub, is commonest in fairly good rainfall areas of foothills and valleys, while *P. glauca*, of rather more erect and loose habit, is common in open hilly and mountainous areas and may be 18" or even 2 feet high.

Both species grow in clay and are widespread. Both like sunshine, good drainage, a moderate amount of water and some root protection.

Pimelea stricta, "Erect Rice-flower", belongs to the same group but the flower heads are less regular in shape and the flowers less erect, though not less attractive. It is commonest in the sandy lowlands.

Pimelea octophylla, "Downy Rice-flower", is well named. Its big creamy pom-pom heads (often 2 inches across) are downy with soft hairs. They nod on the ends of slender very slightly branched stems clothed with soft narrow leaves like slivers of grey-green flannel which become less hairy when older. "Downy Rice-flower" is a plant of sandy soils in S.A., Vic. and N.S.W., and the slender bushes, one or two feet high, are often abundant near the sea. Instead of a collar of broad bracts as in many *Pimelea* species, the heads are surrounded by bracts very like stem leaves.

Pimelea alpina, "Alpine Rice-flower", is a delightful little wandering prostrate plant of the mountain tops where it grows in rocky outcrops and alpine meadows at between 4,000 and 5,000 ft. in Victoria and New South Wales. Its tough little branched stems creep through other ground-hugging plants, their dark, smooth leaves inconspicuous, but every upturned branch tip bearing a head, about half an inch across, of little red or pink flowers. It flowers on the mountains in December and January.

Pimelea ligustrina, "Tall Rice-flower", is a large much branched bush, often 6 ft. high or more with big nodding white flower heads often touched with pink and enhanced by a cup of 4 or more broad green bracts under the flower. As one would expect from its leafy stems and large privet-like leaves, it is chiefly a forest plant of good rainfall areas. It grows in all south-eastern states. There is a mountain form, often very abundant at above 4,000 ft., that is a dwarf (1-3 ft.), rounded, densely branched bush with very large flower heads.

SOME GRACEFUL RICE-FLOWERS

Pimelea flava "Yellow Rice-flower." The yellow rice-flower is slender and graceful, growing from one to three feet high, with long branchlets crowned with little clusters of butter-yellow flowers. The pairs of rounded very bright green leaves (yellow-green where other species are dull or

bluish green) are almost as decorative as the flowers. The whole plant has an air of distinction, and it will grow in any well drained soil, sheltered from wind and with a few rocks to keep its roots cool.

There is a rarer but less attractive white-flowered form in N.W. Victoria, and this is the common form in South Australia. The yellow flowered form grows in western and southern Victoria, in Tasmania, N.S.W. and Queensland.

Pimelea axiflora, "Tough Rice-flower", could well be called the "Graceful Rice-flower." It is a willowy bush or small tree, not bearing flowers in heads on the branch ends but in tiny white or cream clusters in the leaf axils. The leaves are narrow and one or two inches long, and each leaf with its accompanying white cluster is part of a wreath-like branchlet, slender and drooping. The whole bush is like a veil of loosely open white lace when it flowers in the mountain forests of Victoria, Tasmania and N.S.W.

PIMELEA ROSEA

Experiences in its propagation and cultivation by H. BRACKPOOL

Plants were bought from "Floralands," Gosford, N.S.W.. One was put into a rockery of bush sand 12" deep and did well for about two years but, being a position where it had too much shade in the colder months, it became diseased and died.

The second one went into a bush sand rockery two feet deep with much more sun in the winter. This is still doing fairly well but not as well as the cuttings that I struck from it.

Two of these struck cuttings were put against the house in my heavy clay based Eastwood soil, where it is usually fairly dry, being partly sheltered from the rain by overhanging eaves. This position faces north east so that the plants have practically full sun from the north during the colder months. I rarely water them. They have now reached about three feet in height and are a little greater in spread. These are the most healthy and flower magnificently. See colour plate on page 100 of No. 23 issue of "Australian Plants."

For a proportion of our Australian plants I find that the best positions are against the house facing N.E. or N.W., where plenty of unobstructed sunlight can reach them in the colder months, and where they miss much of the rain. Even my kangaroo paws are against a wall which faces north west—five healthy clumps which do not look as though they will ever get the black smut that killed so many previous ones.

To return to *Pimelea* cuttings, these strike easily in bush sand under jam jars, but only when taken as three or four inch tips from a plant when it is rushing its growth—tip pieces that show no signs of branching out, and have not yet begun to make flower buds. These are the cuttings that I always select to achieve success. Usually they make enough root in two or three months to permit planting out.

This is being written in the middle of July. I just went outside and noticed that there were at the least two of these suitable tips showing on a *Pimelea rosea* at this moment. There could be more if I searched.

PIMELEA IN SOUTH AUSTRALIA

by I. G. HOLLIDAY

Unfortunately we must admit to a very limited knowledge of *Pimelea* under garden conditions. This is partly because plants of these beautiful shrubs have been difficult to obtain. In my experience *Pimeleas* appear to be very difficult to raise from seed, although this is possibly due to a lack of knowledge of their correct requirements. A few species such as *Pimelea ferruginea* are relatively easy from cuttings, but generally speaking, in Adelaide at least, cutting material of most of the attractive species is difficult to obtain.

Pimelea ferruginea from Western Australia grows fairly easily in garden conditions provided drainage is adequate. Due mainly I think, to heavy wet top soil (common in winter in Adelaide) plants often collapse when apparently thriving. I saw this plant growing in beach sand dunes at Culham Inlet in W.A., where we tested the soil and found it to be Ph. 9, similar to Adelaide's coastal sand dunes. This would indicate that this species may thrive in sea-side gardens. It is a lovely dense, compact plant, 2-3 ft. high, with small, shining, decussate leaves, and masses of pink flower heads, usually in spring.

Pimelea rosea (deep pink form) from near Albany in W.A. is also occasionally grown here, but requires well-drained acid soils. The white flowering form of this species appeals as a superior subject for gardens. In the Darling Range near Perth it can be seen lining the roadsides in masses—small compact bushes so loaded with large pure white flower heads that the foliage is barely visible.

Pimelea suaveolens. A very fine form was seen in future farmland abutting the Salt River Road along the boundary of the Stirling Range reserve. The flower heads were particularly large and a bright sulphur yellow. (*P. suaveolens* in the Stirlings had cream flowers).

Two S.A. coastal species, *P. dichotoma* and *P. serpyllifolia* both grow naturally along the coastal sand dunes and are well suited for exposed sea-side gardens. Both are low spreading small shrubs with crowded decussate leaves. *P. dichotoma* has bluish foliage and small white flowers. *P. serpyllifolia* has rounded green leaves and pale yellow flowers with orange stamens. It is doubtful if these 2 plants would have much appeal away from difficult coastal sites, as there are many other more ornamental species.

P. octophylla is one of my favourites. A lovely slender, erect shrub to 2 ft. with soft, woolly, grey foliage and large, drooping silky, cream or pale lemon flower heads. This species prefers well-drained sandy soils. Unfortunately plants are not easy to obtain. It is also native to Victoria and New South Wales.

P. glauca is a wide-spread little shrub found over most of temperate southern and eastern Australia. It has small, opposite, broadly lance-shaped leaves and numerous heads of creamy flowers in late winter-early spring. An attractive little plant suited to most well-drained soils, but not readily available.

P. humilis is a dwarf species with white flowers from south and eastern Australia which forms an attractive rock garden plant.

PIMELEA FROM THE LAUNCESTON AREA OF TASMANIA

by J. SIMMONS

There are 17 species of *Pimelea* in Tasmania, 6 of which are endemic. Of these 13 are to be found in the Launceston area.

P. linifolia (syn. *P. spathulata*). A small shrub common around the Tamar area and East Coast of Northern Tasmania. The large floral bracts are often red or rust coloured, making the nodding heads into dainty bells. An extremely attractive shrub and well worthy of garden cultivation. Flowers July.

P. glauca. Grows on the sea coast where it is very common. It survives even in the salt spray area and flowers profusely.

P. ligustrina. Found in moist gullies near sea level and in the open at about 2000'. It has very large terminal creamy-yellow flower heads (1-1½") and large leaves to 2". A good garden subject.

P. humilis. A small plant, about 6" high with white terminal flowers. It is rather widespread and almost covers our Legana block (PH. 5-2).

P. drupacea. A shrub 4-6' with insignificant flowers. The fruit is a shiny black berry or drupe. It is common, mainly in hilly gullies.

P. pauciflora. A much branched slender shrub found mainly near rivers in the North. It has pistillate and staminate flowers apparently on different bushes. Small yellow flowers, few in number.

P. serpyllifolia. Found mainly in the North East and Bass Strait Islands.

P. flava. "Yellow *Pimelea*." Grows well in cultivation, seems to like clays and damp situations. Lately becoming frequent in the East Tamar area, also on the East Coast. Our own bushes were planted in a clay bank and are thriving.

ENDEMIC SPECIES—

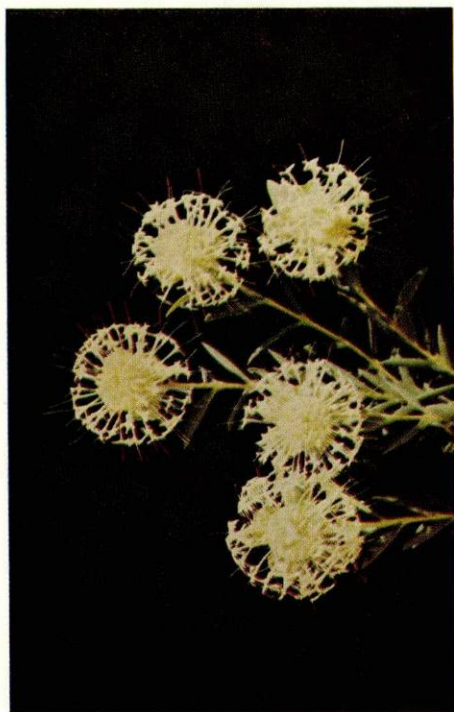
P. sericea. An erect, much-branched shrub, 1-2' high, silky hairy except for the upper surface of the leaves. It has an abundance of creamy flowers in large, erect, terminal heads. Grows well in cultivation favouring a cool spot as it is a mountain species.

P. nivea. "White Cotton Bush." An erect, sometimes straggly shrub, 2-6'. It is covered with cottony hairs except for the upper leaf surface which is a dark shiny green. Common on rocky hillsides, especially in the North of the State from sea level to 2000'. In good soil it grows into a beautiful shrub covered with large white terminal heads to ground level. A pink variety is found near Launceston. Well worthy of cultivation.

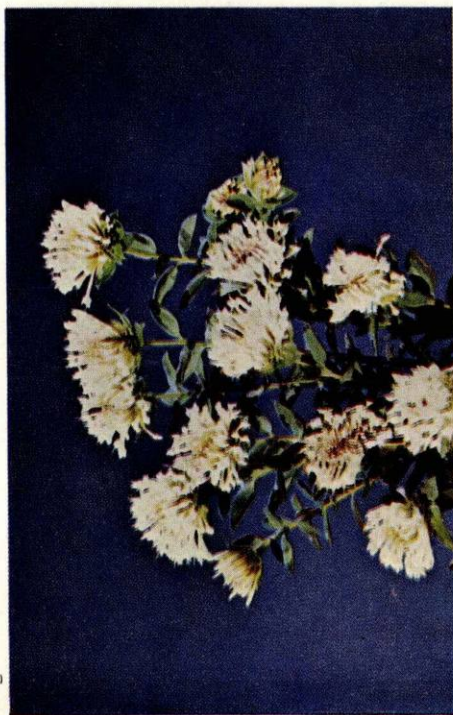
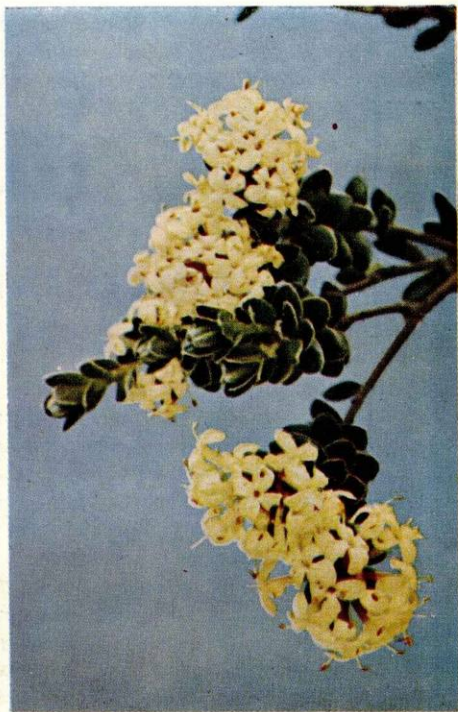


Pimelea nivea

Pimelea floribunda



Pimelea sericea



Pimelea sylvestris



Pimelea nivea

P. filiformis. A spreading, prostrate shrub, 1-2' wide, glabrous or almost so. Flowers numerous in dense terminal heads. A fine-foliaged dainty plant ideal for a rockery. It suckers down naturally and transplants readily. The flowers are white with a red background and are larger in cultivation than in the natural state. It is confined to a relatively small area near Launceston.

P. pygmae. A small, prostrate, much-branched, almost glabrous shrub forming dense mats or cushions—an ideal rockery plant. Flowers solitary in the upper axils, dioecious. Staminate flowers 3/16", pistillate smaller. Locally found at Great Lake.

PIMELEA IN SYDNEY

by J. R. ENGLISH

There are seven species of *Pimelea* found in the Sydney region, and quite a few more in the far corners of the State. None of these are common excepting *Pimelea linifolia*, which abounds on the Hawkesbury Sandstone, and in some habitats flowers for nearly the whole year, and elsewhere for never less than five months. *Pimelea linifolia* is a rather variable shrub in appearance, depending mainly on the proximity of other plants and the situation, whether it is erect, compact, or spreading. It responds readily to pruning when cultivated. There is not much variation in the flowers, which are always in terminal heads, but sometimes seedlings are blind, with no development of the inflorescence. They are most rewarding in cultivation, with a steady and persistent flowering of clear white flower heads, with a delicate pink tinge in the bud stage, the whole clasped in four fairly prominent ovate bracts. The narrow linear leaves are opposite and have one prominent vein. They are insignificant enough to hardly be noticed, however, with a plant so floriferous, the foliage is not important to a grower, especially when the flowers are in a multitude of terminal heads.

In my experience, the other Sydney region species, *P. ligustrina*, *P. collina*, *P. spicata*, *P. curviflora*, *P. hirsuta*, are not common, or striking enough to be worthy of cultivation.

However, two outstanding West Australian species are cultivated around Sydney with varying results. The main one, *Pimelea ferruginia*, is grown extensively with almost complete success. This plant, which is so beautiful, both in flower and foliage, will grow in a variety of soils in any sunny position, so long as it does not receive heavy winds under saturated conditions, as these are liable to pull the surface roots from light soil. In its natural habitat the plant grows in clefts in the cliffs on the southern coast of Western Australia, situated where the wind can blow over it without causing harm.

The other W.A. gem, *Pimelea rosea*, is much harder to cultivate. This plant, which is very like our *P. linifolia*, except for the red instead of white flower heads, generally stays alive longer if kept constantly moist, and once again is well protected from strong winds, or carefully staked through the foliage. It tolerates both clay and light soils, but be sure to grow it as an undershrub, or at least in semi-shade. It is subject to sunscorch, and resents being watered in sunlight, like most of its fellow West Australians. *Pimelea spectabilis*, the other popular West Australian, has so far proved impossible to grow in Sydney. It strikes from cutting readily, but really resents humidity.

COLLECTING PIMELEA SEED

by F. LULLFITZ

To collect seed, flowers of *Pimelea* need to be carefully watched after pollination as seeds usually mature fairly quickly and ripen and fall within a few weeks. The heads are very subject to insect attack and this makes collection of good seed difficult.

For best results seed should be collected from cultivated plants so that insecticides can be used after pollination to ensure a good harvest. Seed from cultivated plants normally gives better results in germination and adaptation of plants to garden conditions than seed collected in the wild.

PROPAGATING PIMELEA

by E. WITTWER

From Seed: Good seed of *Pimeleas* is difficult to obtain. Germination data resulting from sowings carried out at King's Park refers to only a few species and rather small seed quantities. Sowing was done in autumn or end of winter; germination was in most cases slow (43 to 60 days) except for *P. microcephala* which required only 30 days.

Seedlings develop quickly and potting needs to be carried out at an early stage. Young plants will branch out more if nipped back when about 2"-3" high. *Pimeleas* usually produce flowers the first year (one plant of *P. physodes* had three flower heads 9 months after germination). *P. sylvestris*, *spectabilis*, *hispida*, *rosea*, *sulphurea* and *ferruginea* grew to really good flowering bushes in the second year. Pruning back after flowering improves the shape of the plant; the number of the following year's flower heads will be increased; spindly species will be made more wind-resistant. Well cultivated plants will also produce better and more abundant cutting material for propagating purposes.

From Cuttings: The species which strikes most easily from cuttings is *P. ferruginea* which naturally grows as a much-branched, compact bush supplying large quantities of good cutting material. This is the only species which is grown commercially in Perth.

Other species grown successfully at King's Park, but with lower percentages are *P. physodes*, *hispida*, *suaveolens* and *rosea*. For these, cutting material from bush plants only was available. The results from cuttings of cultivated plants should be better. Flower heads were produced at an early stage but it was found advisable to remove the buds to strengthen the young plants. Best rooting results were obtained with cuttings of semi-hard to one-year-old wood taken at the end of summer and during autumn.

These two articles form part of the King's Park report on page 170.

YOUR GUIDE TO NATIVE PLANT SEEDSMEN

Nindethana, Box 5, Dripstone, N.S.W. For all Native Seed. Packets, ounce or pound lots. Free list on application. Special supplies of West Australian Seed.
Australian Seed Co., Robertson, N.S.W. Bulk or packet lots. Stamped envelope brings lists.
Western Wildlife Supply, Gilgandra, N.S.W.—Bulk supplies of natives and exotic tree and shrub seed to the trade—Special collections to order.
King's Park Seed Supply, King's Park, Perth, Western Australia—Seed list 1/6 post free, seed 3/- pkt.



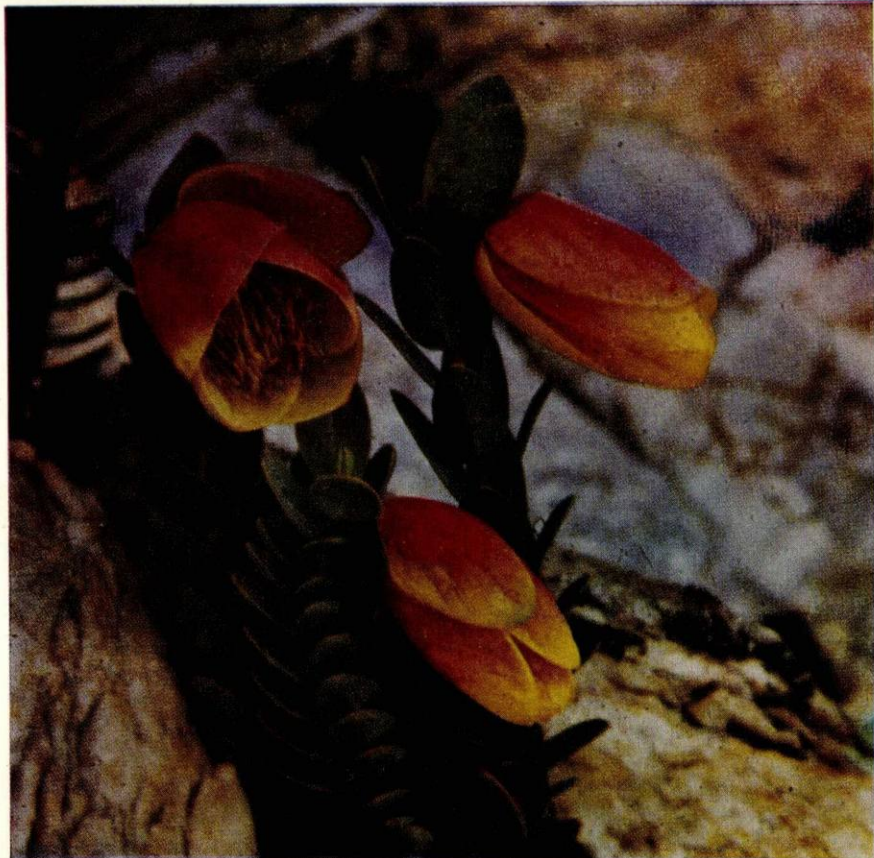
PIMELEA FERRUGINEA

The most outstanding and successful *Pimelea* for garden cultivation. It thrives in normal garden conditions. In attempting to bring to you the magnificence of the flowering bush, and they all flower like this one, the full beauty of the flower heads that reach $1\frac{1}{2}$ " diameter and the glossy green regular leaves, is lost. The flower is very similar to the colour plate of *Pimelea rosea* on page 100 of our last issue.

PIMELEA FERRUGINEA

A coastal or near coastal species, usually found growing in sand dunes or rocky soils in 18"-25" rainfall. Forms a relatively dense, slightly upright, dome shaped bush. Leaves are linear, about $\frac{3}{8}$ " long, light green in colour and fairly close together. Involucral bracts are roughly heart shaped, $\frac{3}{8}$ " long and light green in colour. The flower heads are terminal, about $\frac{3}{4}$ " across, varying in colour from deep pink to white, and are borne in profusion on the top half of the bush. Flowers August-February.

A good species for exposed coastal areas where it could be used as an individual specimen or low hedge to 2' 6".



Colour Photography by J. H. Willis

PIMELEA PHYSODES—QUALUP BELL

PIMELEA PHYSODES

This is the famed Qualup Bell, which is found growing on quartzite and sandy soils within 20 miles of the sea in 18" to 24" rainfall. It appears to be equally at home on the plains or mountains where it may be found growing on the summits. The main stem usually branches at about 1' into 2 to 6 more or less upright branches. Plants rarely exceed 30" in height but have been observed to 5'. Leaves are ovate, $\frac{3}{4}$ " long, leathery in appearance, smooth, light green in colour and growing fairly close together on the last 6" or so of the stem. Involucral bracts are elliptical, up to 2½" in length, 6 in number, varying in colour from light yellow to dull red and they form the "bell" which is pendulous and may be up to 1½" across. The flowers are yellow, but being wholly enclosed in the "bell" they are of little interest. Flower heads vary from a few to a dozen per plant, but nearly 50 "bells" have been observed on a single plant. Flowers June-September.

This species makes an outstanding specimen plant, its only drawback being its straggly habit. An excellent cut flower plant as they will last up to 3 weeks in water.

Continued on page 179

PIMELEA PHYSODES

Experience in Victoria by C. H. Welder, Tullamarine Plant Farm

A *Pimelea physodes* was planted in a raised garden strip on the north side of our house in 1962, in a position at the junction of two paling fences—protected from south and west. First flowering began in June, 1964 and continued until September with a maximum of 18 flowers open simultaneously. Flowering commenced again in June, 1965 with 17 flowers showing at present (July). The plant is now about 2 ft. high and about 1 ft. across.

Although seeds were freely produced last spring and sown in several lots over the following months, no germination has yet occurred. With very little cutting material being produced owing to difficulty in inducing a branching habit, the prospect of the market being flooded with thousands of advanced plants in flower in kerosene tins seems extremely remote.

Of other species *P. ferruginea* succeeds well in open, well drained positions on most soils in this area and is rapidly becoming a popular garden plant. No problems have been experienced by us in propagating this species from cuttings, although seed germination has never been satisfactory.

PIMELEA by Frank Wood—continued from page 150.

PROPAGATION

Propagation is often regarded as an art and specialist operation, but a great deal of success is often obtained with simple apparatus. This is certainly true of *Pimeleas*. Green tip cuttings, which are the same as half-ripe or soft cuttings, are the young growths of early spring. Ripened cuttings are those of the more mature wood which have completed their growth later in the season. My experience has been that the hardier kinds are not difficult to strike in the spring from unripened cuttings in sandy soil under a sheet of glass or on a glassed-in verandah. Among those I have struck in this way are *P. ferruginea*, *P. rosea*, *P. linifolia*, *P. ligustrina*, *P. axiflora* and *P. curviflora*. Perhaps there are exceptions to the rule, and more exotic species are probably not as easy to strike as those mentioned. Potting mixtures should be on the light side—1 part peat, 1 part loam, 1 part sand is a good mixture. If peat is not available use well decayed leaf soil.

The only one I have grown from seed is *Pimelea humilis*, "Dwarf Rice-flower." The seed was gathered from a wild clump growing in my garden and, as soon as ripe, sown in pots of the above mixture with good drainage. However, many people tell me they have not had much success with seed, and perhaps many kinds would be difficult to raise in this way.

LIST OF SPECIES

The Sectional Names have been adopted from Bentham's *Flora Australiensis*, Vol. 6, 1873. All reference since appears to indicate that this classification is still acceptable. The species names etc. have been compiled after reference to the relevant authorities.

Section 1. THECANTHES

Involucral bracts united into 4 lobed cup; flowers hermaphrodite; perianth glabrous, the tube not circumsciss; glabrous annuals with opposite or alternate leaves.

P. punicea R.Br. An erect, glabrous, slightly branched annual. Leaves opposite, lanceolate. Flowers red on terminal stalks. 6" to 1'. Northern Australia (from Arnhem Land to the Kimberleys, W.A.).

P. cornucopiae Vahl (resembling the horn of plenty). An erect, glabrous, stiff annual of about 1'. Leaves lanceolate, mostly ¾" to 1" long, sessile or nearly so. Flower heads terminal, flowers whitish. Nth. Queensland, and Kimberleys (W.A.).

P. sanguinea F. Muell. Glabrous annual, stems slightly branched. Leaves more crowded than in allied species, oblong-linear or lanceolate, $\frac{1}{2}$ " to $\frac{3}{4}$ " long. Flowers blood red; flower heads shortly pedunculate, involucre rather broad, very short anthers. 6". Nth. Queensland and Arnhem Land.

P. concreta F. Muell. A glabrous annual, flowers white. W.A. (Kimberleys).

Section 2. EUPIMELEA

Involucral bracts free like the stem leaves but rather broader; leaves flat or concave, usually opposite; flowers hermaphrodite; perianth tube not circumsciss, silky villous; seed with scanty albumen and broad cotyledons; prostrate or much branched shrubs.

P. alpina F. Muell ex Meissn. (see forward).

P. longifolia From New Zealand. A species on Lord Howe Is. is very dubiously referable to *P. longifolia*.

P. cinerea R.Br. "Ash Rice-flower." Straggling shrub. Leaves mostly opposite, oblong or elliptical, 1" long. Perianth small. 3' to 6'. Tasmania (common chiefly on the hills in the south and west).

P. milliganii Meissn. A bushy densely branched semi-shrub, only a few inches high resembling a Polar Willow; leaves crowded, opposite, ovate, $\frac{1}{2}$ " long, both sides covered with silvery silky hairs. Western mountains of Tasmania at 3000-4000 ft.

Section 3. HETEROLAENA

Involucral bracts free, much broader than stem leaves; flowers hermaphrodite, the perianth tube not circumsciss; anthers with narrow connective seeds with copious albumen and narrow cotyledons; leaves opposite, glabrous, flat (not concave) or with the margins recurved or revolute.

P. spectabilis (Fisch. & Mey.) Lindl. (see foreword).

P. lehmanniana Meissn. A shrub closely resembling some forms of the above, but the leaves broader and shorter. Flowers white with green tinge. 2'-3'. W.A. (from Busselton to the Stirling Range). See foreword.

P. hispida R.Br. Erect shrub with leaves opposite, ovate, $\frac{1}{2}$ " long. 2'-4'. King George Sound and vicinity.

P. leucantha Diels. Shrub, white, Aug.-Oct. Irwin Dist., W.A.

P. rosea R.Br. (see foreword).

P. ferruginea Labill. (see foreword).

P. brachyphylla Benth. An erect branched shrub from under 1' to over 2'. Leaves opposite, rather crowded, sessile, oblong to oblong-linear with straggling recurved margins. Flower heads small, globular. Flowers white. W.A., (King George Sound and vicinity).

Section 4. CALYPTROSTEGIA

Involucral bracts free; various in size and number, sometimes very deciduous, rarely entirely deficient; flowers hermaphrodite or in some cases female by abortion; perianth tube after flowering circumsciss above the ovary, leaving the lower portion only persistent around the fruit. Anthers with narrow connective, the cells when open placed back to back.

Sub-section 1. Calyptridium

Flower heads terminal with 4-6 broad persistent involucral bracts. Leaves opposite.

PIMELEA FROM QUEENSLAND

Extract from a letter kindly sent by S. L. Everist, Government Botanist, Qld.

Pimelea haematostachya is not commonly called "Red-hot Poker" in Queensland (see comment on page 150) but "Pimelea Poppy." *Pimelea decora* is another "annual" species similar to *P. haematostachya* but with broader leaves. It occurs on heavy clay soils of north-western Queensland on slopes which drain to the Gulf of Carpentaria. It is generally known as "Flinders Poppy." *P. haematostachya* also grows on clay soils but is apparently confined to the tributaries of the Fitzroy and Burdekin Rivers, chiefly in the Central Highlands and the Dawson Valley.

Both are "annuals" well worthy of cultivation but they certainly do not "enjoy a light free soil with absence of lime" (see note on cultivation page 147). Both occur on pediocalcic clay soils and both are toxic to livestock.



Photography by W. H. Payne.

PIMELEA DECORA

I have grown the above plant in my garden for three years. The plant comprises a number of branches as shown above, growing to 18-24" long, from a woody stock at ground level. The shoots appear in winter and the branches die back after each summer flowering which gives the impression that the plant is an annual. The flower buds appear at the end of the branches and the bright red flowerhead to 1½ inches diameter is quite striking. As the early flowers die, new buds open above them and the flowerhead extends out becoming a poker of red flower. It is easy to see how some can call it "Red-hot Poker" with a flaming red top and ash grey dying flowers below. I got into the habit of plucking off the old flowers so they do not appear in the photograph above just the live red flowers. In photographs I have seen of these flowers growing naturally in Queensland, the dead flowers bleached almost white in the hot sun and the clump of red topped white pokers to 8 inches long look most spectacular.

I am growing my plants in a light free soil with absence of lime in a very hot sunny, fairly dry position. I see above that in fact they grow naturally in clay and no doubt a heavier soil would give me a more vigorous plant. However I feel the dry light conditions may preserve my root stock better between seasons—Editor.

CALYTRIX

Calytrix are generally small bushes most suitable for the garden. The flower is less than one inch but is a colourful star, one of nature's masterpieces of design. Easily grown in a well drained garden soil, especially in a raised garden bed if not allowed to dry out when young, the gardener is certain of a flowering equal to that shown below. Most are small bushes to three feet if well pruned after flowering and one of the finest plants for the garden of all our natives.

All colours are available in different species such as the finest of golden flowers in *Calytrix angulata* or a plant referred to as "*C. gurulmundi*" from Gurulmundi of Queensland, or the beautiful little W.A. dwarf, *Calytrix glutinosa* and *C. strigosa* with large yellow-centred mauve star-flowers. A layman would be excused for confusing this flower with that of *Calectasia cyanea* featured in colour on the rear cover of No. 23 issue.



Reprinted from "The Vegetation of Wyperfield National Park" by permission of The Field Naturalists' Club of Victoria.

COMMON FRINGE-MYRTLE (*CALYTRIX TETRAGONA*)

A beautiful pink-flowered form of the shrub found in Wyperfield National Park.

The Vegetation of Wyperfield National Park by J. Ros. Garnet—

Price 15/- plus 8d. postage, available from Field Naturalists' Club, c/- The National Herbarium, Domain, Melbourne.

A booklet about the largest National Park in Victoria written in the very pleasant style exemplified by the article "Casuarinas" in this issue by the same author. It is the first time that such a comprehensive flora of a National Park has ever been produced but its outstanding feature is the skill with which the author has presented it, making precise, clear and pleasant reading. Of special merit is 26 pages of sketches, to scale, of 100 species. These are especially designed for the bushlover with no botanical knowledge to be able to determine the name of most species encountered.

WILDFLOWERS AT KING'S PARK — 1

OFFICIAL OPENING OF THE KING'S PARK BOTANICAL GARDEN, PERTH
by J. S. BEARD, Director

On Monday, October 4th, the new native plant Botanic Garden in Perth's King's Park is to be officially opened by the Premier of Western Australia, the Hon. David Brand, M.L.A. The garden has been under construction since 1962 and is still by no means complete, but a stage has been reached where an official opening seemed both necessary and justified, to mark another milestone in its progress. Other such ceremonial milestones have been the setting out of the first tree by the President of the King's Park Board, and the first shrubs by Board members, in May 1963; and the turning on of the water supply by the Minister for Lands in March of that year.

Botanic Gardens to preserve their country's native flora are a relatively recent, 20th century, development in the history of botanical science but even so the movement has been slow to come to Australia. South Africa's National Botanic Garden at the Cape (Kirstenbosch) was established in 1910. Now, fittingly for the Wildflower State, Western Australia has given the Australian Commonwealth the lead. The State Government first began to consider the matter in 1957, plans were formulated by 1959 and a start made with the appointment of a Director in 1961. A Seed Collector's department was established at once, so that a nursery could be opened in April, 1962, and a first crop of 14,000 plants representing 759 different species was raised for initial planting in the garden in winter 1963. In the intervening twelve months the 25-acre garden site was selected and surveyed, and the general lines of its landscaping plan decided upon. The main walks, 12 feet wide, were pegged out, cleared and graded. The bush on the site, which consisted mainly of 20' Banksias and Casuarinas with occasional Eucalypts, was heavily thinned. No complete clearing was done except in a central area planned as a water garden, as it was intended to develop a natural-seeming wild garden by gradual conversion from existing bush. Finally, water was laid on from shallow spears at the foot of Mount Eliza, pumped to the top of the Mount, and reticulated through a ring main of 4 inch cement pipe encircling the garden and over a mile in length. Minor reticulation was by 1½ inch polythene pipe to fixed points for Buckner quick-coupling sprinklers at 40 foot centres. The grass walks have their own fixed sprinkler system installed at ground level. All watering therefore is done from labour-saving sprinklers, avoiding the use of hoses or portable irrigation piping.

All this was completed in time for planting in May 1963, and in each subsequent winter more plants have been added, so that a total of 40,000 plants have been set out and approximately 1,000 different species established. Since Western Australia is thought to contain 4,000 species of horticultural interest, this is only a start, and the work of collection will take many years. Most plants have grown very readily and rapidly. Of course there are problems, but in the main the plants have proved quite amenable to cultivation and have progressed steadily to flowering stage. Some flowered in one year or two, others are taking longer. The most spectacular successes, probably, have been *Grevillea leucopetris*, of which plants reached seven feet high and flowered in two years from seed, and *Kennedya nigricans* which climbed

WESTERN AUSTRALIA LEADS ALL OTHER STATES

All people interested in Australia's floral heritage should reread the second paragraph on page 170 and enquire from their leaders as to what is planned in their State. The Western Australian Government should in turn review their policy on natural reserves before it is too late and their beautiful flora becomes extinct. They hold in TRUST the most exciting natural flora of the world that is fast disappearing in the wake of land development. We sincerely trust that the bold progressive attitude shown in the development of King's Park will be reflected in further planned measures to safeguard their floral trust.

10 feet up Sheoke trees and flowered in one year. At the time of the official opening it is expected that a large part of the garden will be a riot of colour.

The planning and arrangement of the garden has been based on an ecological pattern. A certain number of broad habitat groups were arrived at, e.g. the jarrah forest, the karri forest, sand heaths, and so on. These groups were then allotted to distinct sections of the garden, and when planting is done all material goes into its appropriate group. In this way plants which normally associate in nature are planted together and can be given a common treatment as regards shade, watering and soil preparation. Thus the jarrah forest section is one with an existing good stand of trees, ironstone gravel and loam were added to the soil and shrubs planted are those typical of the Darling Range such as *Leschenaultia biloba*. On the other hand the sand heath section was almost entirely cleared of existing growth to provide full light, the soil required no additives other than compost, and the collection consists of the great wealth of sandheath shrubs. In addition to this treatment there are special display collections of Kangaroo Paws, wattles and feather flowers (*Verticordias*). The garden begins to emerge from the bush as the planted items start to flower and as the walks and paths take shape with the provision of stone edgings and the growth of the grass.

A small valley in the garden is being used to provide a central picnic lawn with an ornamental water garden. A winding watercourse 600 feet long constructed like a mountain stream runs down the centre connecting a string of pools, the water being returned from the bottom pool to the top by pumping. The top pool has been designed to accommodate in due course a Memorial Fountain to the Pioneer Women of Western Australia. In the lower pools there is provision for growing bog plants and riparian species.

Editor's Note: This is part one of a series on King's Park. As mentioned it is proposed to propagate and cultivate the 4,000 species of West Australian wildflowers of horticultural value. In the process an enormous amount of knowledge and experience will be gained which will be recorded in this series of newsletters. The first part tells a little of the history and of the objectives of the Park. To appreciate the wealth of experience to be given us by these competent horticulturalists much more background information is necessary and will appear in future newsletters. We want to know, for instance, more about the watering system, its advantages and disadvantages and how to evolve the best system as well as how and when to water our natives. We want to know what soil they have, how they treat it for best results and what do they recommend. This gardening advice will be coupled with interesting reports on the species being described in the current issue such as those by E. Wittwer and F. Lullfittz in this issue.

COUNTRY READERS—WE NEED YOUR HELP?

We would like to show a line sketch of every species of wildflower described. The obtaining of specimens for these sketches is often very difficult. If those in a position to, would just wrap up a flowering piece of plant in newspaper and mail it by parcel post as shown below, it would be appreciated by all. To achieve this it is hoped to compile a list of people from all parts of Australia who are prepared to go into the scrub in their immediate localities and collect specimens as requested. A botanical knowledge or the ability to name the plants in your area is not necessary. We will provide our plant hunters with adequate advice on what to look for. It could be an interesting hobby for some. Who will volunteer?

We need specimens of all species of *Pimelea* that are not sketched in this issue. Specimens of *Boronia*, *Hovea*, *Tetratheca*, *Epacridaceae*, *Malvaceae*, *Pultenaea*, *Swainsona* and for those for inland, *Ptilotus*, i.e. "Pussy tails."

THE THYMELAEACEAE IN AUSTRALIA

by C. N. DEBENHAM

Take the *Daphne* of Europe, the Leatherwood of America, and the Rice-flower of Australia, add the Paper Bush of Asia, the South African heath plants of *Lachnaea* and *Passerina*, and we have a cosmopolitan assemblage from which to draw a common denominator.

But common leveller there is. It is a set of floral features which, taken collectively, provide distinction and the basis for a rather unique family. The family takes its name from the thyme-leaved (*thymos*), olive-like fruited (*elaia*) members of *Thymelaea* which again illustrate the cosmopolitan nature of the group for they are distributed throughout Mediterranean regions, North Africa, Europe and Central Asia. One species, *T. passerina*, is an annual weed introduced to the United States and, according to Black's Flora, to a localised area within the Yorke Peninsula of South Australia.

While the present discussion is not intended to include much technical detail, a little is necessary to note the feature is the long, tubular or pitcher-shaped floral tube from which radiate 4 or 5 petal-like lobes. Much discussion has ensued on the nature of this tube and the structure of the flower, e.g. whether the tube is formed by a connation of petaloid sepals adnate with the corolla and androecium, the corolla being conspicuous only as a few scale-like petals towards the top of the tube. Heinig (1951) supports the view that it is made up by fusion of the bases of sepals and adherent staminal filaments, with the petaloid scales being of the same order as the sepals.

The stamens are either as many, half as many (as in *Pimelea*), or twice as many as the sepals, and are inserted on the throat of the tube. They emanate as a double whorl which, by reduction or compression, in many cases appears as a single whorl. Frequently an annular disc surrounds the base of the gynoecium, and this nectiferous disc has been considered part of the androecium. The gynoecium typically is syncarpous, unicarpellate, with a single style and discoid stigma. The ovary is superior, uni- or bi-locular, with a single ovule in each locule. Fruit may be a berry, capsule, drupe or nut.

Inflorescences formed by the family are racemose and terminal, in the form of a spike, true raceme, umbel or (as in *Pimelea*) a few or dense-flowered head enveloped by bracts. Leaves are simple, entire but sometimes scale or needle-like, usually alternate, estipulate. The shrub habit is dominant (but compare *Phaleria chermsideana*, sometimes a small tree, with the dwarf, prostrate and spreading *Drapetes tasmanica*), the stems usually with a layer of tough cortical fibres, the toughness of which the reader may be well aware when attempting to separate the stem by hand.

Nevling (1962) assesses 55 genera for the family with some 500 species in all, having tropical or sub-tropical regions as chief centres of dispersal. Of the 55, the author remarks, "It is expected that the number of genera will be reduced by nearly one-fifth in the near future, and a further reduction could be realised by the elimination of a number of genera of 'convenience'." The intergeneric relationships are far from satisfactory alignment, as also the position of the family in a phylogenetic system. Heinig is of the opinion that the true relationships are with the *Tiliaceae* and *Flacourtiaceae*.

Representation of the family within the Commonwealth is limited for there are but five genera, one only (*Oreodendron*) endemic but of isolated occurrence and with close affinities to a genus with fairly wide distribution.

By far, *Pimelea* with about 80 species has the greatest spread throughout the continent. Most of the species are of the temperate south (from west to east), about 20 occur in Tasmania and 12 in New Zealand, and there is a few in the tropics with outlying occurrences recorded for Timor (*P. breviflora*), the Philippines (*P. philippinensis*) and New Guinea (*P. ramosissima*).

While Australia appears the centre of dispersal for *Pimelea* and the region wherein speciation operated at optimum, the reverse is the case for other genera. Not only are the dispersal lines limited for populations more northern or more eastern, so also is speciation. Thus *Wikstroemia* with about 20 species throughout Eastern Asia and the Pacific Islands, has but one (*W. indica*) within the continent. Here it is widespread in the tropical north but it is only along the eastern coast (maximum range the Central Coast of New South Wales) that its southward advance has been possible.

Phaleria, with some 12 species throughout the South-West Pacific and South-East Asian regions has five species almost wholly confined to the tropical east coast one (*P. chermideana*) having a sporadic occurrence in the sub-tropical North Coast of New South Wales. *P. blumei* has advanced from the north but the others (*P. pedunculata*, *P. neumannii*, *P. clerodendron*) appear to maintain exclusive Australian identity.

In many respects similar to *Phaleria*, the monospecific *Oreodendron* of white is based on an isolated population found in poor scrub on the top of Mt. Alexander (alt. 1200m.). The location is one of the peaks of the Atherton Tableland, close to Daintree, where rain forest is "very poor and the soil decidedly porous." The type *O. biflorum*, was noted by Kajewski, its collector, as a small, gnarled and twisted tree up to 5m. high.

The remaining genus in Australia, *Drapetes* (Sensulat), is no less unique in its geography. Three species are endemic to New Zealand, one is recorded for Borneo, one for Magellansland extreme from the southern tip of South America. *D. tasmanica* is on record as being common, as a herb-like undershrub on the mountain summits of western Tasmania. The position of the Australian segment of the broad species recently has been reviewed so now, the segregate, *Kelleria*, appears as a distinct genus. It is quoted as such (*Kelleria tasmanica* Domke) by Costin, 1957, in his account of the high mountain vegetation of Australia. He places it as a co-dominant of the *Epacris petrophila*—*Veronica densiflora* alliance which forms a fjeldmark community virtually confined to the exposed alpine cols and summits of the Kosciusko area, where winds are extremely strong.

Finally, some consideration of the economic aspects may be given for the family *Daphne* and many South African members are of high horticultural interest. The tough fibres of several overseas species have yielded cordage (e.g. the domestic use of Leatherwood *Dirca palustris* in American Indian culture) and raw material for paper manufacture (e.g. the Paper Bush of Asia, *Edgeworthia papyrifera*), although strictly limited to local industry. The latter exploitation is one unlikely to add to the resources of this country.

A KEY TO THE GENERA OF AUSTRALIAN OCCURRENCE

- | | |
|---|-----------------------|
| Stamens 2. Sepals 4. Petaloid scales absent. Shrubs | 1. <i>Pimelea</i> |
| Stamens 4. Sepals 4. Petaloid scales present. One prostrate undershrub confined to alpine situations. | 2. <i>Kelleria</i> |
| Stamens in two whorls of number equal to sepals. | 3. <i>Wikstroemia</i> |
| Petaloid scales present. Shrubs or small trees. | 4. <i>Phaleria</i> |
| Ovary 1-locular | 5. <i>Oreodendron</i> |
| Ovary 2-locular | |
| Flowers sessile, in pedunculate heads with an involucre of 4 small bracts. | |
| Flowers pedicellate, in pedunculate heads without an involucre of bracts. | |

THE FLYING DUCK ORCHIDS

THE GENUS *CALEANA* R.Br. by LEO CADY

This most unusual and unique genus of ground orchids has a distribution that encloses all Australian states and also New Zealand. Two of the species are found in all states excepting Western Australia and also in New Zealand and the other three species are endemic, respectively, to N.S.W., Victoria and W. Australia.

The species are mainly found growing in open forest country or open heath lands, often at the base of the larger trees, in fact so much so that it brings to mind that the plants may derive some nourishment from the roots of a tree.

Very little has as yet been done in proving this point of orchid and tree association, but it could be a feasible point. Mainly these plants are found in sandstone-Eucalypt country.

Two of the species namely *C. sullivanii* and *C. nublingii* are extremely rare plants so a few notes on where and what type of habitat they grow may not go amiss.

C. sullivanii to the writers knowledge has only been collected in a very inaccessible region in Victoria, namely the Mt. Zero-Wonderland Range area, where it is found growing in depressions and soaks always in moss with their tubers on the rocks beneath the moss, another species of the genus found in association with this species is *C. minor*.

C. nublingii inhabits the Blue Mountains area of N.S.W. and was originally collected at Bell, though very little is known of the species, it is said to be found growing on a rocky, sandy, sandstone spur at 3,500 ft. altitude, the spur extends for some considerable distance towards the Grose River, *C. major* and *C. minor* are to be found quite commonly near this species.

A very interesting feature of these two species is that no plants of either species have been found to contain any pollinia and always have abortive anthers.

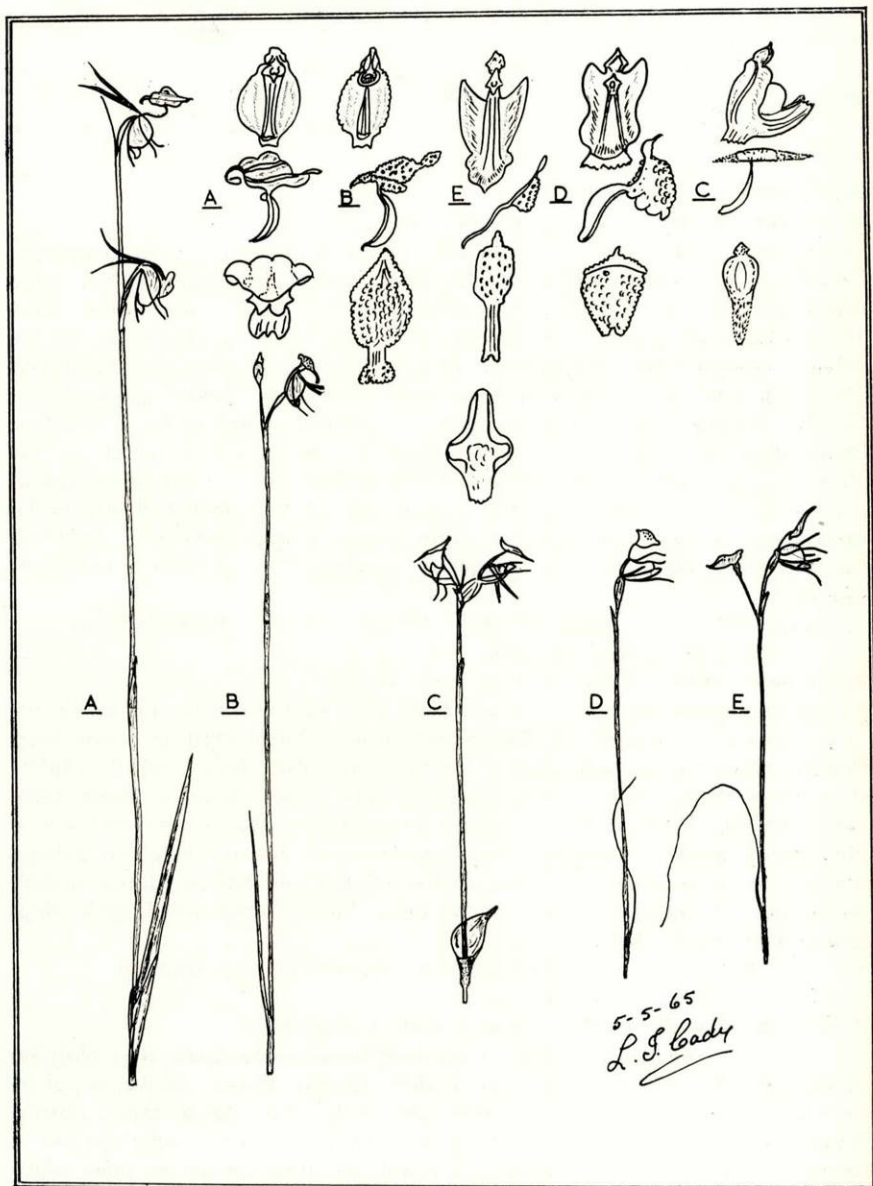
C. nigrita, according to previous authors is rarely found. Its habitat is namely the ironstone and Jarrah country of Western Australia, where it is usually found growing in charcoal in burnt over areas or in very sandy soil.

The pollination of this genus is by insect and shows just what a genius nature is. It is carried out in the following way.

With the labellum in its upright position the insect alights on the lamina, usually clasping it, the labellum springs itself back into the cavity formed by the column wings taking the insect with it and either enclosing or jamming the insect into the cavity, the labellum in this way places the insect in a position whereas the pollinia can be attached to the body of the enclosed insect. The labellum after a period (depending on the time of day as to how long it takes to reopen) resets itself allowing the insect plus the pollinia to escape to go through the same process with another member of the same genus thus effecting cross pollination.

CULTURE

Owing to the fact that most of these species of "Flying Ducks" are very rare plants, little is known about their cultivation. In some cases their rarity



KEY TO THE PLATE

- A. *C. major*, half natural size. Column front view, labellum side and labellum top.
 B. *C. minor*. Column front, labellum side view, labellum top view.
 C. *C. nigrita*. Column front, labellum side view, labellum top view.
 D. *C. nublmgii*. Column front, labellum side view, labellum top view.
 E. *C. sullivanii*. Column front, labellum side view, labellum top view.
 Plants shown half natural size, the part all enlarged.

may be that unless the flower is expanded, they are very hard to see. It is suggested that the following mixture should supply their needs, 40% grey or black sand, 40% leaf mould and 20% peat and charcoal.

Water the plants when they are in growth so as to keep the soil moist, and dry the pots out somewhat in their dormant period.

Shady conditions but with plenty of light would appear to be the best situation.

DESCRIPTIONS OF SPECIES

1. *Caleana major* R.Br. "Large Duck Orchid"

A very slender plant up to 50 cm. high, leaf broad linear to lanceolate. Flowers 1 to 6, deep red-brown to green with brown markings or more rarely wholly green. Flower when expanded 2 cm. long. Dorsal sepal about 14 mm. long, channelled and appressed to and following the contour of the column. Lateral sepals to 16 mm. long, reflexed channelled for basal half then contracted and tubular or filiform for distal half. Petals narrow linear shorter than the sepals erect alongside the column wings. Claw of labellum long and conspicuous (5-7 mm. long) strap-like, lamina ovate, peltate on the claw smooth, entire, centre inflated and hollow; the cavity open below; produced on the column side into a beak and at the other end into a flat appendage. Column curving with large broad wings, forming a receptacle to receive the labellum in its "triggered" position. The labellum is extremely irritable.

Dist.: All states except Western Australia also in New Zealand.

Flowers: Spring and summer.

2. *Caleana minor* R.Br. "Smaller Duck Orchid."

Very slender plant 6 to 20 cm. high. Leaf narrow linear, up to 12 cm. long. Flowers 1 to 6 green or dull reddish brown. Dorsal sepal to 8 mm. long, slightly recurved. Lateral sepals shorter than the dorsal sepal, slightly channelled. Petals shorter than sepals, filiform. Labellum on a lorate claw, very irritable, ovate, peltate on claw, produced on the column end into a bifid gland tipped appendage, the opposite end has a triangular pointed process with a spur on each side, centre inflated and hollow, upper surface and margins tuberculate except at the base. Column long with largish wings and a conspicuous foot.

Dist.: All states except Western Australia, also in New Zealand.

Flowers: Late spring and summer.

3. *Caleana nigrita* Lindl. "Western Aust. Flying Duck"

A slender plant up to 15 cm. high. Leaf basal ovate acute, stem clasping at its base, reddish. Flowers 1 or 2 dark reddish brown. Dorsal sepal to 12 mm. long incurving. Lateral sepals just shorter than dorsal sepal, narrow linear. Petals almost as long as lateral sepals, filiform. Labellum on a lorate claw, peltate very irritable, ovate with a drawn out obtuse point which is much tuberculate particularly towards the apex, the other end with a triangular appendage, this with a few calli. Column wings and foot conspicuous.

Dist.: Western Australia only.

Flowers: August to October.

4. *Caleana nublingii* Nich.

A slender plant up to 20 cm. high. Leaf linear up to 8 cm. long. Flowers 1-4, green with reddish purple markings. Labellum on a long lorate claw extremely irritable. Lamina peltate on claw, pyriform, densely tuberculate with

a narrow longitudinal medium groove widening basally to a bilobate, emarginate or retuse-truncate end; apex broad and rounded upper margins crenate, under side hollow, 2 celled. Column about 15 mm. long light green, the foot extending along the labellum claw and forming a cup-like cavity.

Dist.: Blue Mountains, Bell, N.S.W. only. Flowers: Summer.

5. *Caleana sullivanii* F. Muell.

A very slender plant up to 20 cm. high. Leaf narrow linear. Flowers to 8 more commonly 1-4, very small, light green with reddish markings. Dorsal sepal a little longer than the column, its tip deflexed slightly. Lateral sepals shorter than the dorsal sepal, narrow linear. Petals shorter again, filiform. Labellum on a short claw lanceolate-ovate, passing from a gradually attenuated base into curved stipes of hardly half the length pointed at the anterior end, turgid above and concave beneath, lamina with a few calli towards the centre. Column abortive. Labellum only slightly irritable.

Dist.: Victoria only. Flowers: Late spring and summer.

Growing *Caleana*

by B. WHITEHEAD, Forbes, N.S.W.

1. *Caleana major*

To date a limited success has been had with this species in cultivation here. Plants from three localities were tried in order to ascertain whether there was any indication of a strain more tolerant of cultivation. It appears that plants found growing naturally some distance inland are no easier of cultivation than those from coastal areas.

The most suitable compost appears to be one consisting of 70% natural soil (for the species) and 30% clean sand. A compost of 70% clean sand and 30% leaf mould has also been found satisfactory. Plants grown in the former mixture have shown less inclination to die from rotting than those grown in the latter.

A wet soil surface should be avoided as this readily leads to leaf or stem rot. Plants should be placed in a situation where they are protected from the majority of the natural rainfall, and plants are then judiciously watered by hand. An error of judgment in watering is usually indicated by loss of some plants.

Plastic or terra-cotta pots can be used, provided good drainage is arranged.

2. *Caleana minor*

No difficulty has yet been encountered with cultivation of this species when given normal care for terrestrial orchids. Compost of 60% sand and 40% leaf mould is used. Plants in flower in early December can reappear after a period of dormancy lasting 6-8 weeks. Moderate shade is beneficial and compost is best kept rather dry with occasional waterings.

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Orchids in Tasmania

TASMANIAN ORCHIDS—Part 2 of a series by JOHN FIRTH

I have every respect for those who grow our native plants. It is the sort of thing I aim to do myself when I get more time. The trouble is that all my spare time is spent in collecting plants in their natural surrounding. But let me make it quite clear that I use the word "collecting" in a special way. My collecting consists of sighting the plants in their natural surroundings and photographing them in colour. From a general interest in native flora, I have gradually tended to concentrate on our native orchids. There are over one hundred and twenty species of these in Tasmania, and I hope eventually to view most of these in their native habitats. I say most of these as it appears that a few of them are already extinct. I am finding the last twenty or so rather difficult.

Take *Caleana minor* for example, the small Flying Duck Orchid. Since I took up colour photography of our orchids about 1959, I have been searching intensively for this orchid. Prior to 1959, for over twenty years I roamed Tasmania's bush searching for, and identifying our plants, but never finding *C. minor*. I am now convinced that in this time, I must have occasionally walked right over it without seeing it. The trouble was I was not quite sure where to look for it. In January last year a search of a scrubby area revealed a solitary specimen of the plant which was possibly a year old. Although in a mummified condition, it was obviously *C. minor*. This, of course, did not satisfy me, but it stimulated me to greater efforts in the summer of '64-'65. On New Year's Day I was at last successful. I found a little group of four specimens on an open plain, in association with another tiny orchid, *Prasophyllum brachystachyum*, on Tasmania's East Coast. It was a splendid moment. Here was *Caleana minor* at last, tiny in stature, exceedingly slim, green and brown in colour, and looking like little brown reeds in the grass. An examination of the "head" of the duck—the labellum—showed it to be covered with pimply glands. The flowers are very similar to those of *Caleana major* but on a much smaller scale. In fact one member of the party spoke of them rather disrespectfully, but not inappropriately, as "warty dwarfs."

Now note what happened on our way home from the excursion. This is peculiar but instructive. We found two more areas where our long sought orchid flourished, and both of these we had searched several times previously. In one instance the *Caleana minors* formed a sort of under-storey amongst a hundred or so *Caleana majors*. There they were crouched in the grass at the feet of their stately brothers, overlooked because each time our questing eyes had been drawn to their more showy companions. The next day we re-surveyed the areas we had examined the day before, and counted over a hundred specimens of our little friend.

Caleana major is far more common than the dwarf species. It is also much easier to find. It is not like many of our other Orchids existing underground as a corm for most of the year, and producing overground parts in only a few weeks, and then retiring underground again. Its flowers appear in late spring and early summer, but its narrow rusty leaves can be seen at all seasons of the year.

From the bases of these leaves which occur singly, in spring, a long thin flower stalk rises, lifting a tiny bud to a height of from a foot to eighteen inches. As the bud gradually enlarges it assumes a peculiar form. It begins to resemble a small box with a dark hole at one end. When the time is ripe, the box lid opens, and unrolls itself to become the neck and head of the duck—the labellum, poised over the open box—the column. Any insect touching the duck's "nose" is now due for a shock. When touched the labellum flips back down into its box once more, often carrying the surprised insect with it. As the insect struggles to get clear it brings about pollination. Strangely enough the labellum will recock itself quite readily. This is truly a remarkable example of the ingenuity of nature.

Occasional patches of the orchid are to be found many miles inland. But *Caleana major* usually favours rocky ridges amongst eucalypts, or open heathy country near the sea. I know of one interesting area where only a few inches of peaty soil cover a rocky granite knoll. Here amongst the out-cropping rocks, beneath the shelter of *Callitris* pines and tea trees, overlooking the sea, many Flying Ducks are to be found.

A mile or so away is another colony in far different soil. Here they shelter beneath *Casuarinas* and *Eucalypts* on a heathy plain not far from a swampy area. In fact there are quite a number of these areas on our East Coast where, with experience, one can predict that *Caleanas* will be found. Here's a button grass swamp with *Melaleuca*, and Fairy Bonnets (*Utricularia*), and Swamp Heath. Search amongst the *Eucalypts* along its margin and, as likely as not, you will find odd specimens of this fascinating orchid.

WESTERN PIMELEA—Continued from page 165.

PIMELEA SULPHUREA

An upright shrub to 18", found growing on sand in 14"-18" rainfall. The main stem grows to 9" or so and then forms 3 to 10 more or less upright branches. Leaves are ovate, $\frac{1}{4}$ " long, smooth, green in colour and growing fairly close together on the branches. Involucral bracts are similar to the leaves in shape but are longer and light green in colour and 6 to 8 in number. Flower heads are nearly pendulous, up to 1" across and deep rich yellow in colour. Flowers August-October.

Should be grown as a small specimen plant for the colouring of its flower heads which is the most intense of any of the species of *Pimelea* in the Ongerup area.

PIMELEA SYLVESTRIS

Found growing along watercourses in coarse sandy loam in 20" rainfall. The main stem is upright to 12" to 15" and then forms an open umbrella type shrub to about 3' in height. Leaves are linear-ovate, $\frac{5}{8}$ " long, smooth and green in colour. Involucral bracts are similar in shape and colour to the leaves being 6 in number per flower head. Flower heads are white in colour and about $\frac{3}{4}$ " across. Flowers July-January.

An average *Pimelea* for cultivation. Pruning should be beneficial.

PIMELEA—Continued from page 167.

The West Australian Group

P. graciliflora (Endl.) Hook. A graceful W.A. species. Erect shrub to 2 ft. with pale pink flowers in Dec. It grows on sandy limestone hills in the Darling District.

P. sylvestris R.Br. Perfectly glabrous shrub, except for the receptacle. Leaves opposite, oblong or lanceolate, mostly $\frac{1}{2}$ " to 6", more or less concave. Flower heads globular; flowers pink or yellow. 2'-3'. W.A., King George Sound. The variety *aeruginosa* is notable in that the leaves dry out blue. The bracts of the involucre are large, obtuse.

P. brevifolia R.Br. Low shrub, pinkish white flowers in September. W.A.

P. maxwellii (F. Muell.) Benth. An erect shrub with slender branches, opposite linear leaves and small globular flower heads. 1'-1½'. W.A. (Gordon and Kalgan Rivers).

P. modesta Low shrub, white flower, Coolgardie District, W.A.

P. angustifolia R.Br. Slender erect not much branched shrub, glabrous except for the inflorescence. Leaves opposite, linear or linear-lanceolate, concave, $\frac{1}{2}$ " to 1" long. Flowers white or pink, globular. 1'-2'. W.A. (King George Sound, Stirling Range, etc.).

P. nervosa (Walp.) Meissn. Erect shrub, glabrous except for the inflorescence. Leaves opposite, linear, concave, $\frac{1}{2}$ " to 1" long. 1'-2'. Stirling Range, W.A.

P. tenuis A dense sub-shrub to 2 ft., white to yellow flowers growing in sand heath of Coolgardie District, W.A.

P. sulphurea Meissn. Erect slightly branched shrub, with ovate $\frac{1}{2}$ " leaves; flowers nodding, globular, sulphur in colour. Known as Yellow Flowered Rice-flower" in W.A. 1'-2'. Swan River, W.A.

P. floribunda Meissn. An erect annual shrub, although hard and woody at base. Flower heads creamy-white, nodding. Swan River, W.A.

P. suaveolens (Endl.) Meissn. (see foreword). There are two varieties of the "Scented Banjine"—the variety *tinctoria* has shorter leaves than the type form that dry out blue. The variety *menkeana* is similar but flower heads are smaller.

P. physodes Hook. (see foreword).

P. gilgiana Pritzl. Slender sub-shrub. W.A.

The East Australian Group

P. glauca R.Br. Much-branched floriferous shrub of open country. Flower heads white with 2 bracts, glabrous and two, silky-hairy inside. $\frac{1}{2}$ '-1½'. All States except W.A.

P. linifolia Sm. "Flax Leaf or Slender Rice-flower." (see foreword)

P. colorans A. Cunn. ex DC. Glabrous shrub except for the inflorescence. Leaves opposite, petiolate, linear to linear-lanceolate. Tapering at both ends, concave, $\frac{1}{2}$ " to 1". Perianth like *P. linifolia*. See *P. linifolia* in foreword. Native to N.S.W.

P. spathulata Labill. Now treated as a form of *P. linifolia* but with broader leaves and nodding flower heads. It has much less hairy perianths than *P. linifolia*. 2'-3'. See *P. linifolia* in foreword. N.S.W., Tas., S.A.

P. collina R.Br. Now treated as a form of *P. linifolia*, not a separate species. The leaves are slightly concave with the lateral veins underneath running into the marginal nerve when the leaves are narrow. More pinnate

when the leaves are broad. Q'ld., N.S.W. (S. Coast, C. & N. T'lands, N.W. Slopes), Vic. Flowering June-January but mainly October-January.

P. ligustrina Labill. (see foreword). The variety *hypericina* Benth is a shrub attaining 8'-10', with the foliage and general characters of the typical form, but the involucre bracts usually 6-8, much shorter than the flowers and silky-pubescent or hoary; the flowers rather smaller and more slender. Flowering September-December. N.S.W. Coast bordering on t'lands.

The variety *glabra* is a small bushy shrub about 18" high, with crowded erect oblong leaves 5"-8" long. Flower heads nodding, with 6-8 large involucre bracts glabrous inside, and of a purplish cast when in fruit. Receptacle glabrous. Persistent base of the calyx glabrous from the first, on short glabrous stalks; calyx-tube glabrous, the lobes generally sparingly hairy. Flowering December. N.S.W. (S. T'lands.).

Another variety (unnamed) from the N.S.W. S. T'lands. has a fringe of long white hairs on the margins of the bracts. Flowering December-January, occasionally in February.

P. macrostegia (Benth.) J. M. Black. Glabrous S.A. shrub. Kangaroo Island. Dec.

P. humilis R.Br. Rarely 1' with terminal white flowers and silky branches. Ranges over Vic., Tas., S.A. and N.S.W. (Far South Coast). Known as "Bread and Butter." It flowers in October in N.S.W. and as late as December in more southern areas.

P. sericea R.Br. A bushy shrub, resembling *P. nivea*, but readily known by the underside of branches and leaves which are covered with silvery silky hairs. 1'-2'. Tas. (common towards summits of mountains, e.g. Mt. Wellington, Rodway).

P. nivea Labill. (see foreword).

P. treyvaudii Ewart & Rees. Small glabrous bush about 1'; flowers very small in heads to $\frac{3}{4}$ " wide, surrounded by 8 or 9 pointed bracts as long as the flowers, silky-hairy on the inside and on the edge, glabrous outside. Leaves flat, linear-lanceolate, opposite, $\frac{3}{4}$ " long, the lower ones shorter and narrower. Flowers in summer. Vic., N.S.W., A.C.T.

Sub-section 2. *Phylloleana*

Flower heads terminal with numerous involucre bracts not at all, or scarcely, broader than the leaves.

P. imbricata R.Br. Erect much branched shrub, sometimes completely globular and sometimes clothed from the base with long silky hairs. Sometimes with all leaves except uppermost glabrous, crowded, alternate, oblong-lanceolate, under $\frac{1}{4}$ ". Flower heads globular 6"-1 $\frac{1}{2}$ ". A polymorphic species with pink flowers. Has several varieties. W.A.

P. villifera Meissn. Rather coarse branching shrub, villous with stiffish hairs. Leaves opposite, sessile, oblong-lanceolate, flat, thick but soft. Flower heads globular. Densely hirsute. W.A.

Sub-section 3. *Choristachys*

Flowers in clusters, spikes or racemes without involucre, or the bracts not broader than the leaves and very deciduous; leaves flat or with slightly recurved margins; flowers small except *P. haematostachya*; seeds with scanty albumen and broad cotyledons.

P. drupacea Labill. (syn. *P. umbratica*). An untidy straggling shrub attaining 6'-8', sometimes more. Branches silky hairy. Leaves opposite, oval,

6"-2", smooth above, often silky hairy below, flat or with recurved margins. Flower heads terminal on young shoots, but mostly axillary and sessile. Flowers small, not numerous, white tinged with pink. Vic., Tas.

P. haematostachya F. Muell. (see foreword).

P. decora Domin. Very close to *P. haematostachya*. N. Q'ld. (Hughenden)

P. filiformis Hook. A diffuse or prostrate shrub, glabrous or nearly so with slender almost filiform branches. Closely allied to *P. spicata* but with the leaves usually smaller and broader and flower heads not lengthening into a spike. Tas. (Tamar and Piper Rivers).

P. spicata R.Br. New South Wales species of the Central Coast, similar to above in many respects. Flowers September-January.

P. latifolia R.Br. A broad-leaved Queensland species. Leaves often alternate, elliptical to lanceolate, 1½"-3" long. A spreading silky hairy shrub with short stalked flower heads more or less lengthening into short spikes. 2'. N. Q'ld.

P. simplex F. Muell. An erect glabrous annual with alternate linear leaves. Scattered appressed erect on stems and foliage or becoming almost glabrous except the inflorescence. Flower heads small, globular, depressed, yellow. 1'. S. Q'ld. Vic., S.A., N.S.W. (W. Slopes and Plains). Flowering mostly August-September but on to January.

P. sericostachya F. Muell. Spikes silky; leaves alternate, lanceolate to oblong-linear, ½" to 1" long. Flowers small in compact heads. There is a variety *parviflora* but botanists are doubtful whether it is worthy of recognition. N.S.W., Q'ld.

P. trichostachya Lindl. Erect slender branching annual, glabrous except for inflorescence. Leaves alternate, linear, concave. Flowers small, yellow, without involucre bracts. 1'. Interior of all mainland states. Flowers September-October, but also July-January.

P. leptostachya Benth. A slender undershrub with erect or ascending stems. Glabrous or with a few silky hairs. Leaves alternate, lanceolate or oblong, ½" to 1" long. Fruiting spike long and interrupted. 6" to 1'. Q'ld. (Herberts Creek and Rockhampton).

P. williamsonii J. M. Black. Dwarf silky-hairy shrub 6-12" high, restricted to mallee country and rare. Leaves alternate, flat, about ½" long. Flowers appearing in spring or summer, very small, whitish, in leafy heads that may lengthen into spikes 1"-2½" long. Vic., S.A.

P. spiculigera (F. Muell.) Benth. Straggling shrub to 3 ft. Deep yellow fls., July-Sept. From granite area of the Austin District, W.A.

P. forrestiana F. Muell. Yellow flowers. Slender sub-shrub, Austin District, W.A.

Section 5. MALISTACHYS

Involucre bracts usually small or little different from stem leaves; flowers small, strictly dioecious; male perianth with a slender tube; anthers with a narrow connective; the cells very distinct and when opened placed back to back; ovary abortive, female perianth tube circumsciss over the ovary after flowering, the lower portion persistent around the somewhat succulent fruit and almost adnate to it.

P. argentea R.Br. (syn. *P. myriacantha*, *P. shuttleworthiana*). An erect shrub, with twiggy branches. The branches clothed with soft silky hairs giving the plant a silvery white appearance. Leaves opposite, sessile. Flowers

dioecious, very small and numerous in axillary clusters, shorter than the floral leaves, male on pedicel and female sessile. 5'-6'. North of Stirling Range, Swan River, W.A.

P. clavata Labill. (see foreword).

Section 6. DITHALAMIA

Involucral bracts either absent or not very different to stem leaves; flowers small, strictly dioecious, male perianth with a slender tube, anthers with a narrow connective; the cells very distinct and when opened placed back to back, the ovary abortive and rudimentary, female perianth wholly persistent, with small lobes divided to the ovary or rarely with short tube tardily circumsciss. Fruit not succulent. Leaves opposite or alternate, flat or nearly so.

P. axiflora F. Muell. ex Meissn. (see foreword).

P. leptospermoides F. Muell. *Leptospermum*-like erect shrub; slightly silky hairy. Foliage pale with an almost glaucous hue. Leaves mostly alternate, oblong, $\frac{3}{4}$ " to $1\frac{1}{2}$ " long, glabrous above with 2 or 3 veins on each side of midrib or nearly parallel to it and prominent underneath. Flowers usually white, terminal or axillary. 1'-3'. North Q'ld. (Cawarra etc.).

P. microcephala R.Br. "Mallee Rice-flower." Leaves linear-lanceolate; flower heads very small, perianth hairy and strictly dioecious. Fruits greenish-yellow. Of no garden value. Interior of all mainland states and known in Queensland as Yackahber—an aboriginal name. 8'-10'. N.S.W. (slopes and plains), Vic., S.A., W.A. Flowers April-October.

P. pauciflora R.Br. A plant which much resembles luxuriant specimens of the above, but usually more slender. The perianth is glabrous. Fruit red when ripe. It would be a waste of time to grow it. Q'ld., N.S.W., Vic., Tas. Actually the species proper (southern form) is distinct from the form from northern N.S.W. and Q'ld. which flowers April-December. Southern form flowers October-December.

P. hewardiana (syn. *P. elachantha*). "Forked Rice-flower." A low very slender shrub, more or less hoary with appressed hairs. Leaves opposite, ovate, $\frac{1}{4}$ " long. Flowers yellow, minute in little sessile heads in the forks of branches, appearing October-December. Bracts 2-4, similar to leaves. Vic. only.

P. flava R.Br. "Yellow Rice-flower." Almost glabrous shrub, 2'-4' high. Leaves rounded, $\frac{1}{4}$ "- $\frac{1}{2}$ " long. Flowers small, yellow, congested in button-like heads about $\frac{1}{2}$ " wide, appearing October-December. Vic., Tas., S.A.

P. dichotoma Schlecht. "Diosma Rice-flower." Similar to *P. flava* but with smaller leaves and white flowers. All mainland states.

P. pygmaea F. Muell. Grows at 4,000' in western mountains of Tasmania. This low shrub has a hoary appearance owing to the closely stem-hogging hairs. Leaves opposite, lanceolate. Forms tufts of densely matted moss-like plants. Whitish flowers.

P. serpyllifolia R.Br. "Thyme Rice-flower." A densely branched shrub, sometimes to 4' high, very leafy with smooth ovate-oblong leaves 2-3 lines long, leathery and somewhat concave. Flowers yellowish, very small in terminal heads, with orange stamens. Vic., Tas., S.A., W.A. (chiefly coastal).

P. petrophila F. Muell. Erect shrub with dichotomous slightly hairy branches and smooth foliage. Leaves opposite, lanceolate, $\frac{1}{2}$ " to $\frac{3}{4}$ ". Flower heads small, terminal or in forks of branches. 1'-2'. S.A. (Flinders Range).

P. thesioides S. Moore. Much branched glabrous, yellow-green shrub 2'-3' high, with flaxlike leaves and very numerous loose heads of small yellow flowers, W.A. (Eastern Goldfields and Frazer Range).

Section 7. EPALLAGE

Flowers hermaphrodite, or more or less dioecious; perianth tube usually circumsciss after flowering leaving the lower portion persistent round the fruit; anthers rather flat with a broad dorsal connective, the cells closely parallel on the inner, the whole anthers usually rolled back after flowering; flowers in clusters or heads, rarely solitary or in dense spikes.

P. bowmanii F. Muell. Named after Mr. E. Bowman. An erect shrub, silky hairy all over. Leaves alternate, crowded. Flowers solitary in upper axils. Broad Sound, Q'ld.

P. panicularis F. Muell. An erect shrub to 3', the branches and leaves densely covered with silky hairs. Leaves alternate, sessile, lanceolate or obovate-lanceolate, apex acute, about $\frac{1}{4}$ " long. Involucral bracts 6. Male flowers numerous, crowded in terminal heads to 1" dia.

P. ammocharis F. Muell. Much branched, foliage densely silky. Leaves alternate, oblong. Flower heads depressed, globular. 2'-3'. North Australia (Arnhem Land to Kimberleys), Cent. A., S.A.

P. ammocharis also occurs as quite isolated plants just a few miles south of Horseshoe Bend Homestead, towards Finke township. This is a curious occurrence, as it is not found elsewhere in Central Australia—C. Chippendale.

P. biflora N.A. Wakefield. "Flat Rice-flower." Matted alpine semi-shrub with downy opposite leaves about $\frac{1}{4}$ " long. Flowers small, reddish, in terminal pairs during summer. Vic., N.S.W.

P. curviflora R.Br. Low bush with hairy leaves and dark yellow, often curved, flowers. 1'-2'. N.S.W. (Coast, T'lands, Slopes verging on Plains), Vic., Tas., S.A., Q'ld. Flowering mainly September-December but also May-Sept.

P. micrantha F. Muell. ex Meissn. Sometimes treated as a variety of *P. curviflora*, but with much smaller flowers. S.A., Vic., N.S.W.

P. hirsuta Meissn. Much branched low shrub. Leaves mostly alternate, ovate or elliptical, $\frac{1}{4}$ " to $\frac{1}{2}$ " long. Flowers very few in terminal or apparently axillary clusters. 3'. N.S.W. (mainly coast), flowering August-November.

P. altior F. Muell. A tall bush to 6'. Hairy with short spreading hairs. Leaves opposite, shortly petiolate, broadly ovate to orbiculate, under 6" long. Flowers heads terminal or in forks, not many flowers. N.S.W. (N. Coast), Qld. (Brisbane River, etc.). Flowering September-December, March-April.

P. octophylla R.Br. (see foreword).

P. petraea Meissn. Similar to above but leaves softer and erect flower heads smaller. S.A., N.S.W. (N.W. Slopes). Flowers October.

P. phyllicoides Meissn. "Hairy Rice-flower." A slender plant with greenish-yellow flowers (sometimes cream), and crowded, almost erect leaves $\frac{1}{4}$ " long. A variable plant in colour. 1'-2'. N.S.W., Vic., S.A.

P. eyrei F. Muell. A slender shrub of straight growth. Leaves opposite, oblong-linear, more or less silky hairy, $\frac{1}{2}$ " long. Flower heads terminal. 2'-4'. W.A. (Eyre Ranges, Phillips and Fitzgerald Rivers).

P. longiflora Banks & Sol. An erect slender shrub, with linear leaves. Receptacle with long dense silky hairs. Bracts hairy on outside. Flowers white. 1'-4'. W.A.

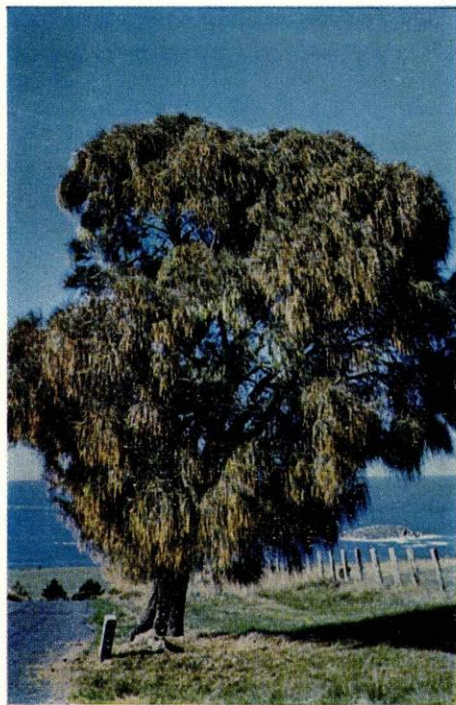
THE CASUARINA

A SERIES ON "STREET TREES" by J. ROS. GARNET

In writing about Casuarinas, I am sorely tempted to indulge in a kind of botanical dissertation—a first class way of learning something about these quite fascinating plants.

However, my purpose is to write about them as street trees. Consequently any remarks about their peculiar anatomy will be purely incidental.

The Editor has since prevailed on Mr. Garnet to describe Casuarina more fully in the next issue . . . "The Casuarina — 2".



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CASUARINA STRICTA

In the days of Benitham and Mueller, eighteen species of Casuarina were recognised. Nine of the eighteen were recorded as occurring only in Western Australia. At least twice that number are now known but still, almost half of them are Westralian and endemic in that part of the Commonwealth. Despite the variety of species which are to be found throughout Australia, only nine or ten grow to a size which would qualify them for use as street trees. Most of the species which commend themselves for the purpose occur in the eastern States of Commonwealth although, for dry inland localities, the tall Centralian Desert Oak, *C. decaisneana*, would seem to be admirably suitable on several counts. Like most of the Casuarinas, it grows rapidly and the mature tree is tall, straight and fairly symmetrical but it lacks the

density of foliage of the species which flourish in temperate and less arid environments. In places where a shade tree is wanted other species are to be preferred.

Casuarina stricta, *C. cunninghamiana*, *C. glauca*, *C. cristata*, *C. luehmannii*, *C. littoralis* and *C. torulosa* all possess features which merit a second glance. They grow easily from seed, hence the establishment of a reservoir of nursery seedlings is unlikely to prevent any problems—nor is seed gathering a difficult matter. Mature female trees generally hold plenty of unopened cones and the winged seeds discharge freely from the valves within a week or so of harvesting the cones. It is only a matter of collecting ripe unopened cones, letting the seeds discharge, then planting them in the soil or sand with the tip of the wing sticking out of the ground and waiting until the plants have germinated and grown to a size suitable for distribution singly into separate containers. In time, if damping off is avoided, most of them will be ready for planting in their permanent position in the street and an avenue of well-grown Casuarinas is indeed something to see and admire.

In my travels I have seen some such avenues, some of them deliberately planted and others more or less accidental—where a municipal or other road construction authority has left the naturally occurring roadside trees in their natural and irregular spacing to lend distinction to a thoroughfare.

Among some growers of native trees *Casuarina stricta* has its bad points and one of them is a tendency to throw up suckers when the tree is ringbarked or when its roots are damaged or severed—rather in the manner of some of the exotic poplars. Under natural conditions, suckering does not appear to occur at all frequently. When it does it is, no doubt, due to root damage by cockchafers or other predatory animals.

Along the Princes Highway, near Werribee, the species exhibits the phenomenon well but the parent trees have all suffered at the hands (or machines) of roadmakers. However, on the spacious verges of this Geelong road the resulting and unusual density of the trees is not a bit amiss. Some fine examples of *Casuarina stricta* are to be seen on the Mornington Peninsula, especially near the shores of Port Phillip Bay and along the Nepean Highway. Some of the very old trees with trunks up to a foot in diameter, are still clean, umbrageous and shapely.

I have three favourites among the Casuarinas—"favourite" because I know them well and people in most States of the Commonwealth will know them too. One is, of course, *C. stricta*, known in Victoria as the "Drooping Sheoke" and, in New South Wales, as the "Swamp Oak." Another is the aforementioned "Desert Oak" whose cones are the largest of all Casuarina cones and ornamental too. The third favourite is *C. littoralis*, the "Black Sheoke" or "Corky Oak" of every eastern State. All three can grow to handsome trees, a character they share with species such as *C. cunninghamiana* (the River Oak), and *C. torulosa* (the Forest Oak), both of Queensland and New South Wales, and *C. equisetifolia* (the Ironwood) of the tropics and habitats beyond Australian shores.

There is something appealing about these Casuarinas. There is grace in the movement of their branchlets as the wind glides through the foliage. The gentlest breeze enlivens the air with their quiet song even though the leaves have little to do with the sound. The leaves are mere vestiges and are represented by an ensheathing ring of tiny teeth at the end of

each node on the wispy branchlets. The petioles (or leaf-stalks) of these tiny leaves are to be seen as more or less noticeable ribs which extend from node to node along the length of the needle branchlets. The song of the wind in the Casuarinas owes much to the fluted branchlets.

The number of ribs or leaf-teeth is one of the characters used in distinguishing species; the length of the branchlets between nodes is another, but a more important means of classifying the species is to look closely at the cones (and the seeds) from the female trees or, in some cases, from trees which habitually carry flowers of both sexes.

In the field (or along the street) other features serve for ready, if not always reliable, identification. In all of the tree species the trunks are clean and ensheathed in rough and tough persistent bark, the furrows of which widen and become deeper with age. The leaves (or "branchlets" to be technically correct) are generally a guide to the species. The pendulous and rather long branchlets of *C. stricta* and *C. torulosa* (and the rather erect and much shorter branchlets of *C. suberosa*) are dark green and generally dense enough to produce a fairly shady tree. The grey "Belar", *C. cristata*, of the dry inland and "Buloke", *C. luehmannii*, of swampy places as well as of habitats similar to those of the "Belar," have rather thick and hoary branchlets whose internodes are several times longer than those of *C. stricta*. Both "Belar" and "Buloke" are rather like the "Desert Oak" in that they are not shade trees. But whether the foliage is green or grey, pendulous or erect, shady or otherwise the trees it belongs to are good to look at and they always look at home. And so they should for they are as typically Australian as the Eucalypt, and they would probably grow a lot better and prove a lot less of a nuisance than some of the Sugar Gums which many country towns favour as street trees. To begin with, they would not need to be lopped or pollarded or otherwise mutilated in the interests of overhead power lines or telegraph wires and that should be something to be grateful for.

Seen in the sunlight a well grown male tree in full bloom has a crown of burnished or old gold. Each slender branchlet, terminating in a catkin of tiny pollen-laden flowers, adds its shaft of bright colour to the scene. The female trees, when in bloom, are not so conspicuous unless one chances to gaze obliquely through the foliage towards the setting sun. From a certain angle one will then see the tufts of crimson flowers scattered along the branches glowing like fire. But this is a sight one seldom sees, perhaps because it is not often one can view at just the right angle the sun low in the sky through a flowering Casuarina.

PIMELEA—Continued from page 184.

P. stricta Meissn. Erect rather slender shrub with white flowers loosely branched. Leaves opposite, lanceolate. Flower heads globular, usually nodding. N.S.W. (W. Slopes), Vic., Tas., S.A. Flowers July-November.

P. preissii Meissn. A narrow leaved species with white flowers. 1'-2'. W.A.

P. holroydii F. Muell. This is a remarkable sub-tropical species, approaching *P. haematostachya* in appearance, but with broad bracts and persistent perianth of *Heterolaena* and others of *Epallage*. W.A. (Hamersley Range).

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PIMELEA AND FROST

by TOSS FRAZIER, ARMIDALE

Preliminary trials of these plants, though very limited at this stage, give encouraging results and there is good reason to believe that most eastern states species at least will prove to be very frost hardy. My only experience with W.A. species was with *P. rosea* last season. This one took a lot of heavy frost (no recordings taken) but died from other causes before the heaviest frosts were experienced.

Present winter conditions have been more severe than is normal, ground temperatures recording as low as 10° F. (twice) and several ranging from 12° to 17°.

Pimelea linifolia (*P. involucrata*) is healthy and undamaged and is approaching full flower—a good *Pimelea* with several forms.

P. ligustrina. Suffered severe foliage damage by a 10° recording in May whilst in full tender growth. Has not been damaged since and new growth has commenced.

Two other *Pimelea* sp. which came from the north coast heath areas are healthy and undamaged. Their exact identity is not known at present but will be published in a further report of frost hardy natives in the December issue.

BOOK REVIEW

THE ALPINE FLOWERS OF THE KOSCIUSKO STATE PARK Price 12/6

This beautifully presented book has four main features. Foremost is the large, 16 full colour plates of wildflowers in the Park. (Portion only of one of these colour plates is reproduced showing *Pimelea ligustrina*, in this issue). The photography and colour reproduction is superb. Interesting articles, each written by expert and obviously an enthusiast of the subject, include: "A Unique Flora" generally describes the flora of the park; "Australia's Largest Park", describes the purpose and extent of the park and "In Ancient Times", delves into the geological formation of the area. This is an essential reference for those interested in our Alpine flora of this amazing park.

GROWING AUSTRALIAN PLANTS by Noel Lothian and Ivan Holliday Price 37/6

"Obviously it is important to know the conditions under which a plant flourishes in nature in order to grow it successfully . . . in a single habitat . . . the garden." This quotation from the introduction sets the pattern of this very practical book for beginners. Australian plants recommended for cultivation in a home garden are then grouped in chapter under the headings of their native habitat. A quote from another chapter entitled "Planning The Garden", is typical of the practical approach of the authors, both of whom are regarded as experts in the cultivation of wildflowers. "There is a tendency to treat Australian plants as separate from others, and this is, of course, quite wrong. Provided a plant's native habitat is known and understood it can be treated in the same way as any other plant." The book is styled especially for growers in Adelaide but can be used with advantage, anywhere.

CORRECTIONS FOR OUR LAST ISSUE No. 23 DATED JUNE, 1965

The editor wishes to offer a sincere apology for the following errors in spelling of botanical names in our last issue. We go to considerable lengths to ensure that this aspect is beyond reproach but in that issue we slipped very badly.

Page 99—*Pileanthus linearis* should read *Pileanthus limacis*.

Page 101—(Rock Gardens—2), *nobilis* instead of *nobilis*, *ferruginia* instead of *ferruginea*, *Correa decumbens* instead of *Correa prostrata*.

Page 102—*Actinotis* instead of *Actinotus* in two places and *Brachycombe* instead of *Brachycome*.

Page 103—(Plants of Special Merit), *Astraloma* instead of *Astroloma* in two places.

Page 106—*Styidium ripens* instead of *S. repens*.

Page 113—*Arthrocnemum* instead of *Arthrocnemum*.

Page 115—(Cassias), for *C. leurenii* read *C. luerseii*.

Page 117—for *Orylobium lanceolata* read *O. lanceolatum* and for *Pelarogentum* read *Pelargonium*.

Page 118—C. Hammett's *H. elegans* means *Humea elegans* and Freeman's *Corea* should be *Correa*.

Page 128—Lists of *Eria* species—Our practice, in line with modern use is to not use capital letters in the second (specific epithet) of a species name, hence *E. Johnsonii* is *E. johnsonii*.

Page 133—For *Thryptomene hymenomena* read *hymenonema* (two places).

Page 134—For *Jasminum* read *Jasminum*, for *Aldrouanda*, *Uticularia* and *Folypompholya* read *Adrovanda*, *Utricularia* and *Folypompholya* respectively.

Page 140—Last par (from D. minnus), for *Rhododendron* read *Rhododendron*.

Page 141—For *Grevillea streglitziana* read *G. steiglitziana*.

Page 104—"Dwarf Acacias"

It was mis-stated that *Acacia farnesiana* does not occur in Australia. The following report from D. J. Nelson is of interest:

Acacia farnesiana, a tall shrub is common in some creeks in the Alice Springs District and is eaten by cattle in hard times. Good stands of it can be seen in the Harry & Burt Creeks, respectively 32½ and 36 miles north of Alice Springs.



Colour photography, Eric Gordon.

THE FLYING DUCK ORCHID—CALEANA MAJOR

In spring, a long thin flower stalk rises from the base of a narrow rusty leaf, lifting a tiny bud to a height of from 12 to 18 inches. As the bud enlarges it assumes a peculiar form. It begins to resemble a small box with a dark hole at one end. When the time is ripe, the box lid opens, and unrolls itself to become the neck and head of the duck—the labellum, poised over the open box—the column. Any insect touching the duck's "nose" is now due for a shock. When touched the labellum flips back down into its box once more, often carrying the surprised insect with it. As the insect struggles to get clear it brings about pollination. Strangely enough, the labellum will recock itself quite readily.

All species of *Caleana* are described with instructions on their cultivation.