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Photography by D. M. Foster

CORREA SCHLECHTENDALII

WILDFLOWERS OF SOUTH AUSTRALIA FOR YOUR GARDEN

SOME SMALL SOUTH AUSTRALIAN EUCALYPTS

by I. G. Holliday

South Australia possesses large tracts of land where the small tree or mallee eucalypt is the dominant tree. Many of these species extend east, north or west to other states, but there are some which are exclusively ours.

This article describes a number of these smaller South Australian eucalypts. Two of these, *E. gillii* and *E. youngiana*, extend across the border into New South Wales and West Australia respectively, but not the others.

E. brachycalyx. "Gilja" is native only to Eyre Peninsula, the Flinders Range and its eastern plains.

It is a small, bushy mallee to 20 ft. high with narrow, shining leaves and smooth white bark on all limbs but the base of the main trunks where the bark is rough and dark grey in colour. Distinguishing features are the rusty red, striated and hemispherical, operculums and the enclosed or slightly exserted valves on the small, conical fruiting capsules. Flowering occurs in spring and summer when the small white or cream flowers appear in handsome masses. "Gilja" is an easily grown species, suited to coastal planting as well as inland where rainfall is 10"-25" annually.

E. brachycalyx var. *chindoo*, The "Chindoo Mallee", is similiar, its differences being the narrow tips of the fruiting valves which are prominently exserted and generally slightly smaller fruits and narrower leaves. It is only known to occur on Eyre Peninsula, South Australia.

E. cladocalyx nana—"Bushy Sugar Gum". Although well known throughout temperate Australia due to its adaptability for farm planting, the "Sugar Gum", *E. cladocalyx*, surprisingly is not a common tree under natural conditions. Here it is indigenous to only 3 areas of South Australia, in the Flinders Range, on Kangaroo Is. and Marble Ranges of Eyre Peninsula.

The Eyre Peninsula form is a much smaller and more compact tree, perhaps better suited as a farm shelter tree than the upright, taller form. It is this form which is known as *E. cladocalyx nana*, the "Bushy Sugar Gum". "Bushy Sugar Gum" is usually a single-stemmed, low, but spreading tree to 25 ft. high with very glossy, green leaves and shiny bronze new growth. Bark is smooth in cream, grey and orange colouring. The creamy-yellow flowers occur in summer. This is a very hardy tree suited to most soils.

A distinctive feature of the "Sugar Gums" is its juvenile leaves which are virtually circular on bright red stems.

E. cosmophylla—"Cup Gum". Although still found in bushland in the Mt. Lofty Range near Adelaide and also in poorly drained areas of Kangaroo Island, the "Cup Gum" could now almost be listed as a rare species, particularly as it is seldom cultivated. It is usually a small tree or shrub (near the sea) but can reach 50 ft. under favourable conditions. It has a dense, spreading crown, rather large, broad, dull green leaves and smooth, pale grey, or pinkish bark. The feature of the "Cup Gum" is its large cream flowers which are conspicuous in winter months. Fruits are large and cup-shaped on very short stalks "Cup Gum" favours the poorer soils of quartzite origin but where rainfall is 30" or more annually. Little is known of it as a cultivated tree.

(To be continued in the next issue)

CONTENTS OF THIS ISSUE—It is the usual practice to include on this page a guide to the articles in the issue but, when the issue was finalised it was found that such a huge array of species have been mentioned that it was impracticable. The issue has been prepared by South Australian readers on South Australian wildflowers and they have done a marvellous job of it. The wildflowers described will grow in other States and the issue is of wide application. For this reason Ivan Holliday's article has been thrust in at the last minute and will have to be continued next issue, for which, I hope he and the real editor of this issue Lance Howland, will forgive me.—Editor.

HERBACEOUS PERENNIALS

by T. R. N. Lothian, Director, Botanic Garden, Adelaide

Over the past couple of decades interest in Australian plants has increased, until today a very wide selection is cultivated regularly.

Emphasis has been given mainly to trees, shrubs and climbers, but more recently gardeners have been cultivating native orchids and some of the bulbous groups. Some have attempted to grow a few of the herbaceous perennial plants, but these are by no means as easy to grow, as are the other groups. Also the availability of supplies makes it more difficult, usually necessitating those interested in collecting their own propagating material.

Within Australia there are many hundreds of species of herbaceous native plants and this article will deal only with those native to South Australia. However, because many of the species are widespread those described will be found in other regions, especially the eastern States.

Cultural Requirements

In general terms herbaceous plants are those which have a perenniating root stock from which arises annually numerous shoots which ultimately produce flowers. These plants are more demanding in their requirements than trees and shrubs because they are often found in specific habitats and unless these can be simulated success will not come easily.

Although some groups are found in association with major plant communities, e.g. mallee, savannah and the like, the majority are more restricted. Two principal areas in which these plants are found are either along or near water courses and their flood plains, or associated with sand dune country. While these two groups will need very different cultural requirements both media are usually acid in reaction. Further, it must not be assumed that species growing on limestone hills or plains will grow in limey soils. Often they grow in a soil layer on the top of such rocks and this soil can be distinctly acid due to leaching by rain.

While the water retaining capacity of the soil is important, the density of the soil is also a major influence on successful growth. Generally trees or shrubs which grow naturally on light and sandy soils do not thrive on heavy soils, but the converse is true. Herbaceous plants, on the other hand, appear to have very much less tolerance. It is essential therefore to ensure that the soils in which the plants are to be grown closely resemble those in which the plants are growing naturally.

Another factor greatly influences their growth and this is the pH of the soil. The woody plants often show great tolerance and plants from sub-acid soils can be grown successfully in alkaline areas. Most herbaceous plants require a slightly acid soil and poor growth results if this is not available. Very few herbaceous species (but not bulbous) are found in calcareous sands near the coast, or where such dunes have become stabilised inland. Many, however, are found in the inland region where sands are usually acidic.

Unlike the general run of exotic herbaceous plants which are cultivated in gardens, very few of our native species will tolerate shade, therefore full sun together with well-drained sites and acid soil requirements are essential.

Editor's Note—Continued over page and then to page 311. Because of the restrictions on the position of colour plates, this fine article has to be illustrated and continued in this fashion.

STRAW FLOWERS OR EVERLASTINGS

The large plant family *Compositae* includes the genera Helipterum and closely related *Helichrysum* many of which are attractive garden plants.



Photography by Ron Hill

HELICHRYSUM SCORPIOIDES

A very useful plant for the rock garden, or dry wall, is *H. scorpioides*. The stems are somewhat prostrate, but the flowering stems are erect and bear heads of yellow flowers. The whole plant is somewhat greyish in appearance. *H. apiculatum* is also covered with dense greyish or white tomentum, the leaves are variable in length, also in breadth, and are greenish white in appearance. The heads of bright deep yellow, or even orange, flowers are most attractive. It is a variable plant and the forms found near the coast are usually more tufted and compact and produce excellent ground cover.

Editor's Note—The choice of colour slides is difficult. Close up views of flowers are often misleading but sometimes necessary to show flower detail. The above colour plate shows the plant as well as the well-known form of the everlasting flower. The colour plate opposite shows the detailed structure of the flower and was used in preference to the other slide I have of this species which shows a compact shrub covered with a mass of yellow flowers so tight that there is little detail, just a blaze of colour.

NATIVE GROUNDSELS OF DAISY FAMILY

The native groundsels—*Senecio*—are usually robust growing plants of various form and habit. Most have bright yellow or yellow orange flowers of variable size and there are several species which warrant growing.

Senecio magnificus shown above is spectacular, often 3 feet in height. The erect stems are covered with long oblong toothed leaves and the entire plant has a bluish white colour. At the tops of the stems large heads of bright yellow flowers are produced, which make a spectacular sight when the plant is in full flower. The closely related and somewhat similar *S. megaglossus* also has large heads of yellow flowers. Both of these are usually found in the vicinity of water courses or flood plains, and while the soils are generally well drained ample moisture is present during the growing period. Therefore attempts to simulate these conditions will be necessary if success is to be achieved.

Senecio lautus is widespread from the coastal regions to the far inland. It flowers almost all the year round and therefore would make useful colour in the garden. *S. odoratus* (which is a misnomer) is a stout and erect perennial up to 3 feet high with white cottony tomentum on the under surface of the leaves. It is an attractive plant when in flower.

(Continued on page 311—HERBACEOUS PERENNIALS)

Photography by Ron Hill



S. A. WILDFLOWERS

A FEW "MUSTS" FROM SOUTH AUSTRALIA *by R. R. Schahinger*

In dealing with South Australian plants, or plants of any state for that matter, it is quickly apparent that in a botanical sense state borders mean very little. For example, the Sturt Pea, South Australia's floral emblem is by no means confined to this state, and the same applies to many other plants growing here. Therefore I prefer to deal with them as Australian plants and then give the locality in which I know that they are found.

The following is a brief list of what I consider to be among the finest plants native to South Australia. There are many others which could be included but this is not intended as an exhaustive list, simply a selective one.

Cheiranthera linearis. This plant has so many desirable features that it really deserves an article to itself.

When in flower it is spectacular (a traffic stopper if you prefer). The flowers are deep blue, five petalled, and up to two inches across with a centre of gold stamens. They are in terminal heads of up to twelve flowers in a head, and on one plant of mine, there were between thirty and forty heads, although this was an exceptional plant. When not in flower (unlike a rose bush which tends to be a prickly eyesore), it is self-effacing and almost difficult to find, and prefers to grow up through other shrubs and use them as support.

The leaves are pinnate, deep green, and the shrub itself is slender and usually less than two feet high. It is October flowering, very hardy, and fortunately strikes easily from cuttings. Distribution is fairly wide through the Mount Lofty Ranges.

Cheiranthera filifolia, illustrated in colour on page 221 of Vol. 4 is a climber but the flowers are similar. The petals are more pointed and the gold anthers are not nearly as heavy. *C. linearis* is a more graceful and floriferous plant.

Callistemon macropuntatus. This is another shrub which slips easily into a place among the best. A bush five to six feet high, it is free-flowering, the flowers being rich red-oronge brushes with gold tipped anthers, the whole brush being three to five inches long. It flowers in November. They are quite mognificent in some of the Flinders Range gorges where they grow best alongside the gravelly creek beds. They have a wide distribution.

Acacia gracilifolia. This is another plant from the Flinders, and is common in the Alligator Gorge area. It is a bush six to eight feet high with long pinnate sticky leaves and in early October the whole bush is a rich gold mass of flower.

Hakea francisiana. In full flower this is a beauty. It is an upright tree-like shrub growing to about 10 feet high. A good specimen carries numerous flower spikes about 8 inches long in varying shades of pink and as added interest there are plenty of woody seed capsules.

The leaves are 6-10 inches long, fairly stiff and narrow and have very marked longitudinal veins usually 5-7 in number.

It grows well in the Adelaide hills although it will not tolerate wet feet, and occurs naturally on the west coast of South Australia down from Tumby Bay. Colour plate on front cover of No. 44 issue, Vol. 5.

Acrotiche depressa (native currant). A low upright bush to two feet high with a quite different appeal. It is always neat in habit and deep green; but its most interesting feature is that it flowers and fruits prolifically around the base of the main stem. The flowers are greyish white racemes and the fruits are bluish black berries about currant size. It is easily grown and can be found near Williamstown about thirty miles north-east of Adelaide.

Eremophila macdonnelli. This is from the dry hot northerly parts of South Australia and is so different from any other plant known to me that it selects itself for this list. The bush is rounded to about three feet and the leaf form varies from very narrow and hairy to a wide oval shape ½-¾ inches long. The flower is a startling shiny purple about 1½ inches long, and is a flattened tube shape becoming petal like at the open end. There is usually a burst of flowering in each heat wave.

An interesting point about eremophilas (I have some 30-40 varieties) is that although growing naturally in the harsher inland conditions, those growing on my block (800 feet up in the Mount Lofty Ranges) with one exception all survived one of the wettest coldest winters on record. Some suffered a certain amount of dieback but all recovered in the warmer weather.

Calytrix tetragona. This smothers itself with such a mass of pink star flowers that it forces its way into this list. It is a branched shrub to about five feet, October flowering, and is fairly widespread. There are pink and white forms, but it is the pink form from the sands of the south east that really catches the eye. Illustrated in Vol. 5, page 325.

Melaleuca wilsoni. Another from the South East which is probably our best S.A. *Melaleuca.* Like most melaleucas it flowers in November and is one of those that flower all along the branches, like *M. exarata.* The brushes are bright pink and very numerous and in favourable conditions this shrub can grow up to ten feet across. Illustrated in Vol. 2, page 384.

Hardenbergia violacea. This one is too good to leave out particularly as it flowers in August before most other things show up. This is an outstanding foliage plant particularly during a flush of new growth. Also it always tends to give the impression that it is a climber but really I think it is quite content to grab something and hang on rather than go exploring. There are three colour forms, lilac, white and pink. Occurrence widespread.

Grevillea lavandulacea. A real gem in the smaller form, which is rarely more than two feet across and a few inches high. The larger form growing to about seven feet across by three feet high is quite a fine plant; but does not have the gem like quality of the smaller one. The leaves are short, greyish green and narrow; but the flowers are fairly large, lush looking and in varying shades of pink. Flowers in September and October.

Clianthus formosus (Sturt Pea). This plant must be included in the list. It happens to be the finest pea-flower in existence.

Phebalium bullatum. A particularly attractive upright shrub of two to three feet with small bumpy green leaves, and in September it is smothered with golden yellow stars. This is a pleasant shrub, nothing harsh and prickly here. It is considered to be a bit touchy, but one of my bushes is four years old, so if you have the right sandy conditions—no problems. It grows near Monarto South, forty miles east of Adelaide. Illustrated over.

Two South Australian Species of **Phebalium**

by Margaret Kenny

The genus *Phebalium* in the family Rutaceae is represented in South Australia by six species, all of which may be described as dwarf shrubs, which under suitable conditions flower profusely. A neat compact habit and attractive foliage make them desirable garden subjects. Cut flowers keep well.



Photography by Martin L. Kenny

Phebalium bullatum is a graceful but symmetrical shrub growing up to 1 m. high, but commencing to flower when quite small. The branchlets, leaves, and even the sepals and the backs of the petals are encrusted with silver or rusty brown scales which are particularly conspicuous when the flowers are in bud. The narrow leaves are up to 15 mm. long, with the midrib very prominent on the underside.

The bright yellow flowers are borne in terminal clusters, and when fully in bloom almost obscure the foliage. Thriving in areas of Mallee Heath in white sand with plenty of surface limestone, these showy little shrubs may be found in flower all through the spring.



Photography by Martin L. Kenny

Phebalium brachyphyllum is a much smaller plant than the preceding, in fact when seen at its best in an open situation it has a cushion-like form. The crowded almost orbicular dark green leaves are no more than 4 mm. long and the shrub has a very neat appearance even when not in flower.

The terminal clusters of crimson buds begin to show in late winter, and by early September the little plant is completely covered with the starry white flowers and the last of the crimson buds. It thrives in white sand with surface limestone and gypsum.

HARDY WILDFLOWERS

*VICTORY BY SELECTION by Ken Warnes**

A Study of Trial and Error in a Highly Alkaline Situation

Throughout much of South Australia the presence of limestone severely restricts the selection of plants which can be grown. In 1969 I was presented with this problem in acute form, when old sugar gums were bulldozed from the top of a limestone ridge bringing the rubble and stone around their roots to the surface. Subsequent levelling and cultivation mixed this material through a topsoil with an already high lime content. Parts of the area become unworkable when wet, tend to crack on drying out and plant movement in the wind soon cuts a large hole around the base. Hot dry north winds and cold wet westerlies sweep across virtually unimpeded but shelter from the S.W. to E. is adequate. Altogether a most inhospitable environment for our plants, although drainage and soil fertility are good.

Over the succeeding three years, 49 separate genera have been tried, with 42 surviving to date. Plants are mulched with half o corn sack, then surrounded by straw mulch 4" thick with bales of hay protecting young plants. First-year plants are well-watered every month (on cool change) during summer, also some favoured older specimens as required. Liberal amounts of superphosphate were incorporated in the planting holes with apparent benefit to many genera but inducing severe chlorosis and death in most *Grevilleas* and *Hakeas*. Other plants showed initial yellowing from this dressing but recovered and grew strongly as leaching reduced the toxicity of the super.

The use of sulphur and iron chelate has been restricted to assisting in the establishment of a plant of particular interest or value. Alteration of the pH by chemicals is not practicable in this situation, but I hope the heavy mulching will eventually have some corrective effect on the upper soil level.

Although many of the genera have been confined to only a few, even single species, three have proved themselves in sufficient numbers to warrant their recommendation as reliable free-flowering groups.

Eremophila

I have planted a great number of these shrubs and with the exception of a few desert species they show great promise. Among the best under trial are:

E. behriana. A ground cover plant which suckers slightly in the wild. Round, toothed leaves and small purplish-blue flowers.

E. calorhabdos. Twisting, spindly upright growth. Dark green foliage and long, pink, tubular flowers in every axil of the new growth make this one of the best.

E. crassifolia. A procumbent ground cover with small fleshy leaves and blue flowers.

E. decipiens. Three distinct forms are all vigorous growers with orange to red flowers.

E. delisseri. Two forms (silver or gold foliage) of this delightful emu bush from Ooldea made low rounded shrubs with masses of smoky blue flowers. Although quite happy on the limestone they show a definite tendency to blow over or break off in strong winds.

* Ken Warnes, "Waldon", Owen, South Australia, 5460, is the leader of our *Eremophila* study group. If readers would like to join this group and receive advice, seed and encouragement by mail, they should write giving details of their garden conditions and experience, if any. Ken would particularly like to hear from readers who have *Eremophila* growing in their locality as they may be able to assist with supply of seed and cuttings.

E. dempsteri. A slight yellowing of the leaves does not affect the growth or flowering of this low, spreading species which flowers nearly all the year. Succulent green foliage and waxy purple flowers. There is also a more open, upright form.

E. drummondii. Three forms of this species are included. A dense, fine-fleshy leaved form massed with glowing purple blooms is the best. A more upright, finer foliaged form shows some yellowing but is still a lovely sight when in flower.

E. exotrachys. Grew strongly until overwatering caused a sudden collapse. Cuttings taken from the dying plant have struck. Most outstanding.

E. glabra. Including the green flowered var. *viridiflora,* there are 11 forms established, varying in habit, flower colour, foliage colour and texture. A species with great potential as a garden shrub with an infinite variety of forms (I have over 40).

E. hillii. A species closely related to *glabra,* collected at Ooldea with *E. battii, E. delisseri* and *E. latrobei.* See colour plate on next page.

E. ionantha. Soft pine-like foliage and yellow buds opening to smoky mauve flowers make this an emu-bush with a difference.

E. laanii. The white flowered form is a vigorous shrub which needs constant pruning to contain it. The smaller flowered pink form planted recently, shows slight yellowing but is improving. Growth unaffected.

E. maculata. Seven different forms from a wide area are, with the exception of a Queensland form, vigorous, free-flowering shrubs. Another very variable species. Illustrated in colour on page 32 of Vol. 1 No. 10 issue.

E. macgillivrayi. A treasured specimen, grown from a 1" tip. In the wild it is a robust, spreading bush to 10 ft. high, with fleshy, grey leaves and large pink flowers.

E. macdonnellii. Variable in leaf and habit. An oval leaf form from near Marree is a low dense shrub with glorious, rich purple blooms. The Lake Eyre form is more open in habit, with narrower leaves. Other forms are currently being propagated. Surprisingly, these plants from 6" rainfall country appreciate summer water.

E. oppositifolia. A form with terete leaves, bright pink calyx and corolla is a strong, upright shrub, requiring staking. The graceful, fine foliage, and delicate shading of the flowers make this one of my favourites.

E. punicea. Small, dense, grey foliage and intense pink flowers make this a beautiful, but little-known plant.

E. santalina. A purely S.A. species growing to 10 ft. high with lanceolate, light green foliage and masses of pure white, open-throated flowers.

E. scoparia. Broom-like grey foliage and numerous small mauve flowers.

E. subfloccosa. A woolly-leaved shrub which makes a fine foliage contrast even when it's not covered in brilliant green flowers. Becomes spindly with age unless pruned to maintain density. Susceptible to wind damage.

E. weldii. Tiny blue-grey leaves and smoky flowers on a low spreading bush make this a charming plant for rockery or border.

Species planted this year but too young for comment include *E. duttonii, E. dichroantha, E. freelingii, E. latrobei* (S.A. form), *E. pantonii, E. pterocarpa* and *E. youngii* ssp. *longicalyx.*

Species showing enough chlorosis to affect growth are *E. bignoniiflora, E. densifolia* (both after strong early growth), *E. bowmanii, E. mackinlayi* and *E. clarkei* x *georgei.* Recently treated with sequestrene iron chelate.

The only species to die have been *E. granitica* (definitely lime chlorosis), *E. gilesii, E. exotrachys* and *E. pentaptera.*

EREMOPHILA—Hardy Wildflowers for Alkaline Conditions



Photography by K. B. Warnes

EREMOPHILA HILLII

This plate was chosen as, although it does not give detail of flower shape, it does show the form of the bush and how well it flowers. The dome-shaped bush is 0.5-0.8 metres high by 1-1.5 metres wide occurring on 6 ins. of rubbly-clay over sheet limestone at Ooldea siding on the Nullabor Plain. The dense tomentum (matted with hair) of the ovate to orbicular (10-15 mm. dia.) leaves with undulate margins, gives the bush a hoary appearance.

The colour plate of *Eremophila sturtii* on the rear cover shows the flower features of one group or sub-genus Eremophila; a small base expanding almost squarely into a short broad tube. The lobes are rounded and sub-equal with stamens inserted, a basically insect pollinated flower. The calyx is 5 separte oblong-cuneate, petal-like sepals enclosing the base of the flower.

The flowers *E. hillii* are more tubular and similar to those of *E. maculata* shown in colour in our No. 10 issue being in the same sub-genus, *Stenochilus*. In this group of *Eremophila*, the upper lip of the corolla consists of 4 lobes and the lower lip, a single lobe. *E. hillii* is very closely related to *E. glabra* which is described on page 185 of our No. 48 issue.

OLEARIA—Hardy Wildflowers for Alkaline Conditions. Beautiful daisy-like shrubs, free flowering



Photography by K. B. Warnes

OLEARIA CILIATA

Olearia ciliata. This gem for the rockery is a low, dense, fine-leaved bush which pushes masses of purple-mauve, yellow-centred flower heads above the foliage, forming a solid mass of colour over a long period. The flowers are shown in more detail in the colour illustration on page 329 of Vol. 5. The above colour plate will illustrate the ideal form of the bush of this and many other species of Olearia for the garden.

Olearia floribunda. The massed flowers over a long period compensate for their lack of size (bush seedling).

Olearia magniflora. So insignificant is the spindly growth of this species that it is easily forgotten; until September, when it suddenly "arrives". Every shoot terminates in a glowing metallic lilac-coloured daisy, 2" across, to make it a feature of the planting.

Olearia pannosa. This specimen battles against two large sugar gums but still provides a few large (2½") white, gold-centred heads each year.

Olearia muelleri. Occurs naturally in the district and in cultivation is o low, rounded shrub with small, green, obcuneate leaves and pale mauve, 1" flower heads (bush seedling).

Olearia pimeleoides. A neat, rounded shrub with small grey leaves. The 1¼" flowers are white with yellow centres and so dense that the foliage is obscured. A restricted flowering period is the only drawback.

Olearia picridifolia. A rounded shrub, outstanding in early Spring when large panicles of mauve daisies rise well above the narrow, greyish foliage. In common with most cf this genus, pruning maintains shape and improves flowering.

Olearia rudis. Large blue heads with gold centres on terminal shoots above the light green, toothed leaves. Spectacular, but prune after flowering.

Myoporum

Myoporum viscosum. Rich green foliage throughout the year is a feature of most of the genus. This species is no exception with its viscid, serrated leaves, and the masses of starry white flowers, up to 5 in each axil, provide a flowering season of at least 3 months.

Myoporum floribundum. An amazingly adaptable plant from the gullies of the Snowy Mountains. After 2 years my plant is a bushy 8 feet, in heavy bud, and shows no distress on even the hottest day. (One week after writing this glowing recommendation, my plant broke cleanly off at the base in a gale).

Myoporum oppositifolium. Planted this year, it is making strong healthy growth, but flowers are white compared with mauve on the parent. The lime takes the colour from many flowers.

Myoporum parvifolium. The upright form from Kimba is healthy and vigorous. The two prostrate forms (narrow and broad leaves) showed early chlorosis in many plants, almost certainly super-induced, but are now dense, spreading carpets.

Myoporum debile. This species rapidly covered an area 2 ft. across, but after 15 months, chlorosis, combined with insect attack, burnt the new growth fairly severely. Derris dust removed the insects (lucerne flea) restoring plants.

Other Successful Plants

Acacia argyrophylla. A silvery, round-leaved wattle has grown to over 6 ft. in 2 years. This dense, hardy acacia grows to 8 ft. with o spread of 12 ft. and is a good foliage plant from our 10"-16" rainfall country (seed). Most other acacias tried are not happy.

Cassia sturtii. A well-shaped, silvery cassia with masses of deep yellow blossom and reddish seed pods (seed).

Boronia inornata. A lovely, low shrub with tiny fleshy leaves and masses of deep pink flowers from our mallee heaths.

Halgania lavandulacea. Shiny dark green foliage with white reverse. Starry blue flowers are very prolific and an intense blue in colour.

Hibiscus farragei. Very vigorous and must be cut back hard after flowering. Bright pink flowers in mid-summer (cutting and seed).

Dodonaea spp. *D. humilis, D. lobulata, D. microzyga* and *D. attenuata* var. *linearis* all show promise (seed).

Perhaps these experiences will encourage others who have a limestone problem. We can't grow many of the choice W.A. sandplain or east coast plants, and we must be careful in selecting our melaleucas, acacias, correas, hakeas and others, but there are mony plants we can grow, species ignored and neglected in the past, but with a character and beauty for all to see.

GARDEN PLANTS FOR ORY AREAS

Some Recommendations by Ron Hill

The seasan of 1971 has been a particularly good one in the drier areas of South Australia and particularly on the eastern side of the Flinders Ranges. It has been a real garden of native plants. After several visits to the area this season it is surprising that more of the showy plants of this area are not grown in the gardens of native plant enthusiasts in dry areas similar to these. Of course some enthusiasts do grow these, but for those who haven't I have selected a few which should respond well to a little extra attention which a garden can provide and thus correspond to a good season with twice the amount of rainfall to a normal one, which this area has had.

Melaleuca linophylla grows into a shrub to about 10' with linear light green leaves and spikes of white flowers in October and November. It grows near water but should grow well under ordinary garden conditions.

Melaleuca glomerata grows into a similar plant but with grey-green foliage and small heads of yellow flawers.

Hakea ednieana grows into a small gnarled tree which looks somewhat like a large "Bonsai" with dark furrowed bark and divaricate needle-like leaves. The flowers are creamy in colour and are produced in small racemes.

Senecio anethifolius makes a rounded shrub to about 3' with light green foliage ond many heads of deep yellow flowers. See page 289.

Kochia sedifolia is the "Blue Bush" which is common in dry areas, and although the flowers and fruit are not very conspicuous the foliage alone makes the plant worthy of a place in the garden.

Solanum sturtianum grows into a small shrub to about 2-3' and has greyish foliage and large deep purplish-blue flowers about 1" across. These are followed by fruits which change from yellow to dark brown.

Dodonaea lobulata is a "Hop Bush" which makes a shapely plant 6-8' high with fine foliage and masses of fruits which vary in colour from yellow to deep red. A very colourful plant.

Bauhinia carronii grows into a small tree to about 15' with light green twin leaves and produces white flowers. Slow growing but long lived.

Prostanthera striatiflora is a "Mint Bush" which inhabits rocky places and grows to about 3-6' high and has light green leaves and very large white flowers with conspicuous stripes of a purplish-brown colour. It covers itself with flowers during spring and early summer.

Eremophila sturtii is a large shrub to about 8-10' and has dark green fine but sticky foliage and has many bell-shaped flowers which vary in colour from very light to dark pink and mauve. It flowers in early summer.

WILDFLOWER EXHIBITION

KING'S PARK AND BOTANIC GARDEN

PERTH, WESTERN AUSTRALIA, 6005

29th September - 2nd October, 1972

A THOUSAND SPECIES OF NATIVE WEST AUSTRALIAN SPRING FLOWERS WILL MAKE A SPECTACULAR DISPLAY. THE WORK OF THE BOTANIC GARDEN DEMONSTRATED. THIS IS THE NINTH ANNUAL WILDFLOWER EXHIBITION AND WILL COINCIDE WITH THE CENTENARY OF KING'S PARK.

CORREA

CORREAS IN SOUTH AUSTRALIA by Marian Beek

Correas have always been my favourite flowers, therefore it is not surprising that I have many varieties growing in my garden in Naracoorte. We in South Australia are fortunate that we have eight different species growing in our state. Most of our Correas make showy garden specimens and are easy to grow and propagate as all of them can be grown from cuttings. However, some forms take longer to root than others and several forms of *Correa reflexa* in particular are very hard to strike.



Photography by D. M. Foster

CORREA PULCHELLA

I have tried to grow all species. It is my experience that all the "green-bell" Correas are the easiest to grow from cuttings. Also, a green bell is almost a certain indication that the plant comes from a cool well-watered area, and in the garden they like a shady spot, a cool root run and summer watering.

Cuttings can be put in at any time of the year, but the best time is in March or April. By the following spring they will be well rooted and can be potted up separately. During the warmer weather they will grow on and form a good root system in their containers and in autumn they will be ready for planting out in their permanent positions in the garden.

Correa reflexa, has many forms. Plants can be completely prostrate which is often the case in coastal forms, or can vary from 1-6 ft. tall. Leaves can be broad or narrow, smooth or rough, but the flowers are always the same drooping bells with spreading tips. Colour can be green or wholly red or red with green, white or yellow tips.

Correa pulchella, is a procumbent bush with more or less heart-shaped leaves and a profusion of red or orange bells. Pastel pink and pure white forms are rare but have been found in some localities. An ideal plant for rockeries or tubs.

Correa alba, is a coastal plant with white flowers which split open into four separate petals and so resemble our Boronias, which is not surprising as they both belong to the family Rutaceae. The common form is a tall spreading bush which is often too large for the average garden. Much more attractive is its variety *pannosa*, a smaller plant with small round leaves which are soft and hairy and its starry flowers are sprinkled all over the bush. At least one form is completely prostrate and has flowers of palest pink. It grows in the Encounter Bay area where it forms star-speckled carpets in early winter. An ideal ground covering plant, but unfortunately this form is not easy to strike.

Correa calycina, gets its name from the calyx which is broadly campanulate. It is a tall spreading bush with soft green leaves and green bells and grows only in the Hindmarsh Valley Waterfall Reserve and is in danger of becoming extinct. Fortunately it is very easy to grow and strike from cuttings and several nurseries list this plant. It makes an ideal back-ground shrub where its dainty green bells will light up on dull days or on late afternoons.

Correa glabra, is another bush with green bells and smooth glossy green leaves which is also very easy to strike.

Correa schlechtendalii, from the Murray-Mallee makes a handsome gorden shrub with small red and yellow bells which appear in profusion and adorn the plant for a long time. As it grows just as tall and flowers at the same time as *Correa calycina*, they will complement each other when grown side by side against a fence. Colour plate on front cover.

Correa decumbens, is the only Correa with narrow upturned bells and a calyx with alternate long and small pointed lobes. Being prostrate it makes an ideal groundcover plant. It likes a loamy soil and summer watering and is not easy to graw in very sandy soil.

Correa aemulla, is a semi-procumbent shrub with soft hairy leaves and droaping bells which split open, after which each petal curves around its neighbouring pair of stamens. Flowers are green, but turn to pale purple. A dainty and unusual plant which is not easy to grow away from its natural environment.

ACACIAS OF THE ADELAIDE PLAINS

Indigenous Species by Darrell Kraehenbuehl

The district known as the Adelaide Plains, in South Australia, extends north for 100 miles from the seaside suburb of Seacliff, to the small wheat town of Brinkworth. The plains are bordered on the west by St. Vincents Gulf and to the east by the Mount Lofty Range.

Prior to European settlement, almost all the plain except the fertile belt south of the present city of Adelaide, was clothed with a dense mallee woodland. Pioneer farmers had cleared most of the trees and underbrush by the end of the nineteenth century; and the only significant pockets of scrub extant to this day, are small township reserves, sand dune areas and isolated patches adjacent to roads and railway tracks.

Interesting remnants of the original vegetation cover are located at Halbury, near Owen and Barabba, the Dublin Scrub, Two Wells Sandhills, Port Gawler, Roseworthy, and at Folland Park Enfield. Some writers consider that the coastal plains near Aldinga (30 miles south of Adelaide) are an extension of the Adelaide Plains proper; and for the sake of this survey, the acacias occurring in the Aldinga Scrub are included.

Most of the northern sector of the plains has an annual precipitation of 15" per annum; but at Port Wakefield this decreases to 12.80". Rainfall statistics for Metropolitan Adelaide vary from 16½" near the coast, 21" for the city, and up to 24" along the foothills. The Aldinga Plain has an annual average of 20" per annum.

Residents living in the northern and western suburbs of Adelaide and the Morphettvale-Christies Beach district, should experience little difficulty growing many of the indigenous acacias from mallee regions; but only trial and error plantings will determine whether some species are suitable in suburbs with higher rainfall and acid soils.

The following brief key of Metropolitan Adelaide soil types, may be useful for ascertaining in which suburbs, particular acacia species are likely to thrive under cultivated conditions.

KEY:

B: Brackish Swamps. Silty estuarine clays (dark grey clay loams, saline and extremely alkaline in nature).
Grange, Port Adelaide, Rosewater, Royal Park and Wingfield.

C: Coast. Recent coastal white sands with some lime.
Brighton, Glenelg, Henley Beach, Largs Bay, Osborne and St. Kilda.

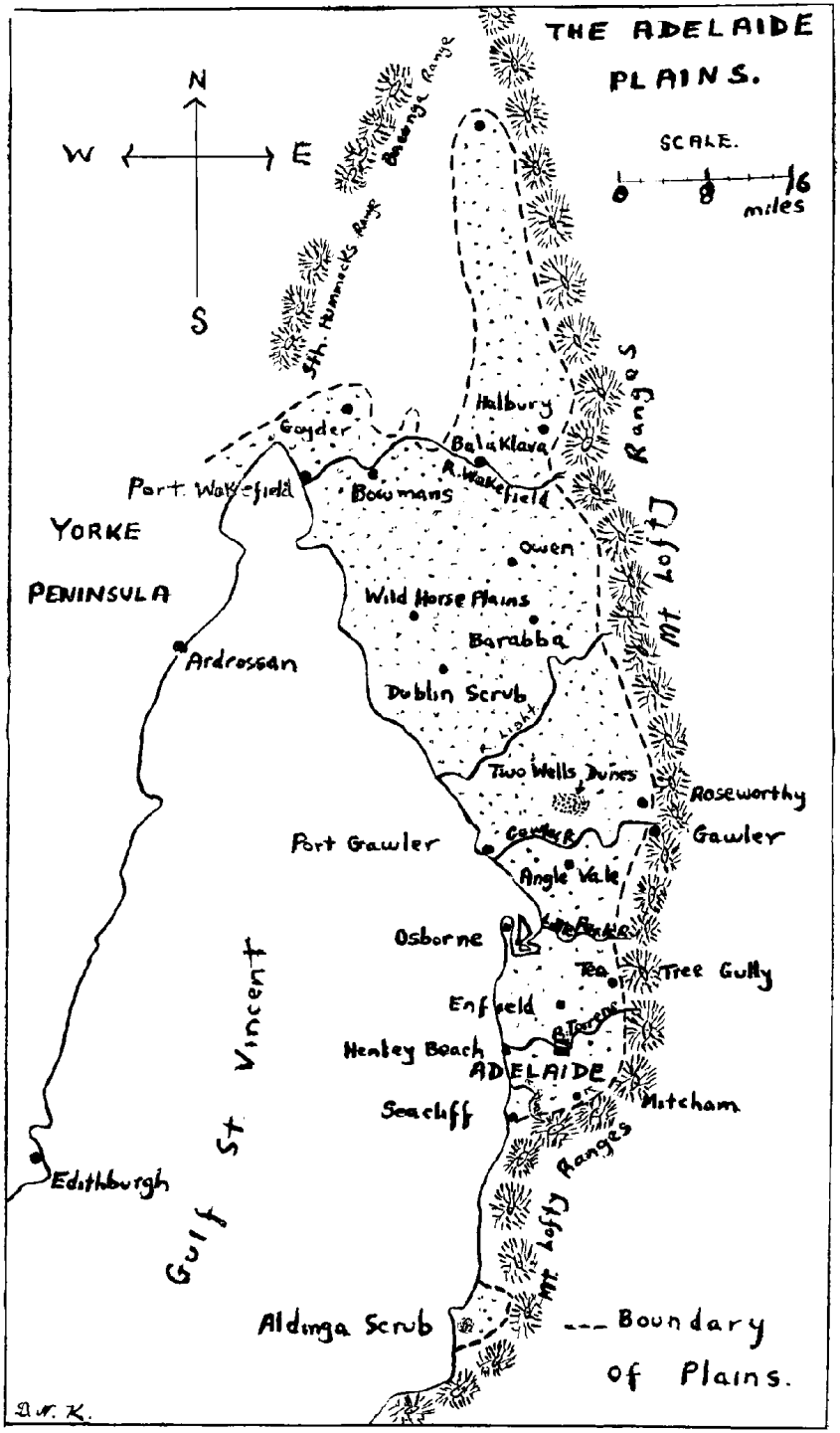
F: Foothills. Red brown earths and solodic/solonetzic soils.
Athelstone, Burnside, Erindale, Highbury, Magill, Mitcham, Modbury, Springbank and Tea Tree Gully.

M: Former Mallee Woodland Association. Red brown earths, calcimorphic soils (mallee loams).
Alberton, Christies Beach, Elizabeth, Enfield, Goodwood, Hindmarsh, Kilkenny, Morphettvale, Mile End, Northfield, Prospect, Salisbury, Thebarton, Walkerville and West Croydon.

R: Red Sand Belt. Old consolidated red sand dunes.
Angle Vale, Camden, Fulham, Grange, Lockleys, Plympton and Somerton.

S: Former Savannah Woodland Association. Red brown earths, black earths (dark fine textured cracking soils "Bay of Biscay") and solodic/solonetzic loams.
Ascot Park, Black Forest, Campbelltown, Edwardstown, Fullarton, Kensington, Marion, Millswood, Norwood, Payneham, St. Peters and Unley.

The twenty three Acacia species recorded for the Adelaide Plains are based upon collections deposited at the State Herbarium Adelaide, and the collections and observations in the field, of the writer.


THE ADELAIDE PLAINS.
N
W
E
S
SCALE.
0
8
16
miles
Mt Lofty Ranges
Gawler
Halbury
Balaklava
A. Wakefield
Bowmans
Port Wakefield
YORKE PENINSULA
Owen
Wild Horse Plains
Barabba
Ardrossan
Dublin Scrub
Light
Two Wells Dunes
Roseworthy
Gawler
Port Gawler
Angle Vale
Osborne
Tea Tree Gully
Enfield
Torrens R.
Henley Beach
ADELAIDE
Mitcham
Seacliff
Edithburgh
Gulf St Vincent
Mt Lofty Ranges
Aldinga Scrub
--- Boundary of Plains.
D.W.K.

Acacia armata R.Br. ex Ait.

Prickly rounded shrub up to 10 ft. high with one nerved oblong phyllodes, about ½ to ¾ inch long and ¼ inch broad. The spiny stipules lend notoriety to this shrub; hence its common names *Kangaroo Thorn* or *Prickly Moses*. Formerly often grown as a hedge. Flowerheads golden yellow. Widespread at Aldinga Scrub, Grange, Springbank, Highbury, Angle Vale and Salisbury. Sept.-Oct. F: M: S.

Acacia brachybotrya, Benth.

Compact erect shrub 3 to 6 ft. high with pubescent branches and obovate phyllodes ½ to 1¼ inches long and between ¼ to ¾ inch broad. A very hardy species for mallee loams. Flower heads deep yellow. Occurs at Bowmans. Sept.-Oct. M.

Acacia colletioides, Benth.

Compact spiny shrub with pungent pointed terete phyllodes about ½ to 1 inch long and ⅛ inch broad. The phyllodes have eight veins on each face. This wattle which usually reaches a height between 6-10 ft. could be useful for dry areas. Small native birds including Chats, Finches and Wrens occasionally use this shrub for nesting. Flowerheads bright yellow. Recorded in 1907 at Dublin Scrub. Aug.-Oct. M.

Acacia cyclops, A. Cunn. ex G. Don (1832)

Tall glabrous shrub 6-10 ft. high. The oblong lanceolate phyllodes are 1½ to 2 inches long, ½ inch broad, and 3-5 nerved. The twisted seed pods are quite ornamental; and the longitudinal seeds are enclosed in a double fold by a handsome thick red funicle. An excellent specimen tree for arid conditions and near the coast. Summer flowering, Dec.-Feb. An isolated colony of this Acacia was discovered in 1970 at Port Wakefield. B: C: M.

Acacia dodonaeifolia, Willd. ex Spreng. (1815).

Large shrub or small tree up to 20 ft. high. The lanceolate one nerved phyllodes are approximately 1½ to 3 inches long and about ½ inch broad. A handsome winter flowering wattle eminently suitable as a specimen tree or fence border. Flowerheads golden yellow. The occurrences at Glen Osmond and Marion are probably adventive. July-Oct. C: F: R: S. (Colour, Vol. 5:297).

Acacia hakeoides, A. Cunn. ex Benth.

Tall glabrous shrub 4 to 10 ft. high with rigid oblanceolate phyllodes 1½ to 4½ inches long and ½ inch broad. A very fine winter flowering shrub which should do very well on mallee loams. Flowerheads large bright yellow. Not uncommon at Halbury, Goyder Siding-Bowmans, Dublin Scrub, Reeves Plains and Barabba. June-Sept. M: R.

Acacia ligulata, A. Cunn. ex Benth.

Rounded shrub 3 to 15 ft. high, commonly known as *Umbrella Bush*. The thick linear oblong phyllodes are 1 to 4 inches long and ½ inch broad. This shrub which is covered with bright yellow flowerheads in Spring, is one of the more commonly distributed acacias in South Australia. A very suitable shrub for mallee soils and seaside gardens. Recent records are from Osborne, Camden, West Terrace Cemetery, Modbury, Aldinga Scrub and Angle Vale. Aug.-Oct. B: C: F: M: R.

Acacia melanoxylon, R.Br.

The *Blackwood* is only a small tree in South Australia 20-40 ft. high. The broad oblong-lanceolate phyllodes are 2 to 4 inches long and nearly 1 inch wide. A useful specimen tree for moist gardens of the Adelaide foothills. Flowerheads pale yellow. Rare on the Adelaide Plains; recorded at Mitcham and Morialta Creek, Newton. Sept.-Oct. F: S.

Acacia microcarpa, F.v.M.

Small glabrous shrub to about 4 ft. with linear-lanceolate phyllodes 1 to 2 inches long, which are occasionally curved. A most attractive specimen shrub for mallee loams. Occurs at Two Wells Sandhills. Bright yellow. Aug.-Oct. M: R.

Acacia myrtifolia (Sm.) Willd.

Glabrous shrub 3 to 6 ft. high with obovate or oblong lanceolate, phyllodes 1½ to 3 inches long and about 1 inch broad. An ideal shrub for foothill gardens. Flowerheads pale yellow. One of the more common wattles of the Mount Lofty Range; but rare on the plains, at Highbury and Tea Tree Gully. Sept.-Oct. F: S. Colour plate Vol. 4, page 317.

Acacia notabilis, F.v.M.

Large glabrous spreading shrub 3 to 10 ft. high with oblong-lanceolate phyllodes, sometimes curved, thick and rigid, 2 to 6 inches long and nearly 1 inch broad. A very useful winter and early spring flowering species for mallee areas and drier situations of the garden. Flowerheads large golden yellow. Seeds freely. Not uncommon in scrubs and along roadsides at Roseworthy, Halbury, Brinkworth, Reeves Plains and Two Wells Sandhills. June-Sept. M: R: S.

Acacia oswaldii, F.v.M.

Named after F. Oswald, a German collector in the Barossa Valley. Tall shrub or small tree 6-16 ft. high with rigid glabrous or glaucous phyllodes 1 to 3 inches long and ½ inch broad. Flowerheads yellow. The twisted and coiled seed pods are a feature of this wattle. Funicle orange. Recorded for Dublin Scrub, Roseworthy and Two Wells Sandhills. Jan.-Feb. M: R.

Acacia pycnantha, Benth.

In South Australia, the ubiquitous *Golden Wattle* is either a tall shrub or small tree 10 to 25 ft. high. The long lanceolate phyllodes are 3 to 8 inches long and usually about an inch to 1½ inches broad. Another very free seeding species. Flowerheads large bright yellow. A well known favourite which still occurs over many parts of the Adelaide Plains, for e.g., Roseworthy, Angle Vale, Salisbury, Highbury, Camden, Grange, Osborne and Aldinga Scrub. Aug.-Oct. C: F: M: R: S.

Acacia retinodes, Schlecht.

The common name for this wattle *Swamp Wattle,* is often a misnomer, as some of the better examples grow to perfection on stiff clay banks or hillsides. Tall glabrous shrub or medium sized tree 6 to 30 ft. high, with long linear lanceolate, one nerved phyllodes 3 to 6 inches long and approximately ½ inch broad. An excellent pendulous specimen tree for moist areas. Flowerheads pale yellow. Only found near the foothills of the Mount Lofty Range at Athelstone and the River Sturt Darlington. Dec.-March. F: S.

Acacia rigens, A. Cunn. ex G. Don (1832).

Tall glabrous shrub to about 10 ft., with slender terete, pungent pointed phyllodes, which are often curved; 1 to 5 inches long, less than ⅛ inch thick, striate, with about 15 or more prominent nerves. A very fine free flowering acacia for lighter soils. Flowerheads bright yellow. Recorded at Wild Horse Plains, Goyder Siding to Bowmans and Two Wells Sandhills. July-Dec. M: R.

Acacia rotundifolia, Hook.

Large shrub 3 to 5 ft. high with pubescent obovate phyllodes about ¼ to ½ inch long. A form from the eastern foothills of the Mount Lofty Range, has more hairy phyllodes. A very handsome acacia known as *Wreath Wattle* in South Australia, on account of it being used for that purpose by the early colonists. Flowerheads deep yellow. Formerly very widespread at Metropolitan Adelaide; but still occurs at St. Peters, Black Forest, Enfield, Salisbury, Springbank and Aldinga Scrub. July-Sept. C: F: M: R: S.

Acacia rupicola, F.v.M. ex Benth.

Glabrous viscid shrub 3 to 6 ft. high with one nerved and rigid, pungent pointed phyllodes, ½ to ¾ inch long and under ⅛ inch broad. This acacia has a varnish like smell which is most characteristic. The flowerheads although a pale yellow, are not unattractive. One of the wattles which might thrive very well near the coast. A single record for the plains at Aldinga Scrub. Aug.-Nov. C: M: R: S.

Acacia salicina, Lindl. (1838).

Known in South Australia as the *Broughton Willow*. A medium sized tree 15 to 40 ft. high with long pendulous "willow like" phyllodes 1½ to 5 inches long and usually about ½ inch wide. One of the most graceful of all the Australian tree acacias. Prefers high clay banks along streams. Suckers readily. Flowerheads sparse and pale yellow. A scarlet funicle folds below the longitudinal seed. Occurs at Dry Creek, Northfield, Angle Vale, River Light and River Wakefield. Sept.-Oct., but often earlier in the arid interior. F: M: R: S.

Acacia sclerophylla, Lindl.

One of the plurinerve wattles with rigid, glossy, oblanceolate or oblong cuneate phyllodes, ½ to 1½ inches long and less than ¼ inch broad. A very attractive rounded and spreading shrub 2 to 4 ft. high. Also a fine ground cover species for mallee areas. Massed flowerheads of deep yellow. Occurs on the plains at Two Wells Sandhills, Wild Horse Plains, Dublin Scrub, Roseworthy and Goyder Siding to Bowmans. Aug.-Oct. M: R.

Acacia sophorae (Labill.) R.Br. ex Ait.

Tall glabrous shrub or small tree 8 to 20 ft. The oblong lanceolate phyllodes 2½ to 5 inches long and approximately one inch wide, have 2 to 5 prominent longitudinal nerves. The seeds of this species are much sought after by the Bronzewing Pigeon. Lateral branches will layer in sandy soil. Coastal Wattle was formerly the common acacia of the white sand dunes of the Adelaide coast from Osborne to Brighton and also the Aldinga Scrub. Flowerheads rod shaped and bright yellow. Aug.-Sept. C: M: R.

Acacia spilleriana, J. E. Brown.

Named after the South Australian Government Printer E. Spiller. A rounded shrub 3 to 7 ft. high, which closely resembles *Acacia brachybotrya* in the field. The flowerheads however, are borne on lang slender penduncles ½ to ¾ inch long, and the seed pods are different. A beautiful shrub worth a try on mallee loams. Recorded from near Balaklava. Aug.-Oct. M: R: S?

Acacia spinescens, Benth.

Rigid spiny wattle up to 3 ft. high, with short striate branchlets; and usually devoid of phyllodes. A characteristic Acacia of podzolic loams of the Mt. Lofty Range. Flowerheads deep yellow. Could be tried for the rockery or on light sandy soils. Recorded for the Two Wells Sandhills and Aldinga Scrub. Aug.-Oct. C: F: M: R: S.

Acacia victoriae, Benth. (1848).

Known as *Royal Acacia* in South Australia. A large shrub or small tree 4 to 15 ft. high, with smooth branches. The glaucous phyllodes, 1 to 1½ inches long and about ¼ inch broad, have sharp spines. Flowerheads are pale yellow (occasionally deep yellow), and the seed pods are borne en masse over the shrub. This acacia was formerly very widespread over the Adelaide Plains. Useful species for a windbreak or specimen shrub in dry area gardens. Recently extirpated at Ascot Park, Blair Athol, Enfield and Springbank; but still found at Holbury, Roseworthy, Angle Vale and Brighton. Sept.-Nov. F: M: R: S.

A WILDFLOWER GARDEN

MY EXPERIENCE WITH RAISED GARDEN AREAS by W. R. Nottage

I hope this article will help those people setting up a native garden or those having poor success in growing some of our more demanding native shrubs and to this end I will quote some of the successes and failures I have experienced in setting up five raised areas.

The First Area

This was a bed triangular in shape 15" high and approximately 20 square feet in area; it was filled with composted soil originating from the local red-brown clay. The drainage proved to be poor and the pH (approximately 8) was too alkaline for the *Kunzea baxteri* that was planted in it for it soon showed the yellow leaves of lime-induced chlorosis and was finally removed to make way for part of a rock pool complex. Hence, lesson one was learnt—poor drainage, wrong soil type and a bed too small.

The Second Area (a simulated W.A. sand plain area)

This overcame several of the problems of the first one but unfortunately introduced others. The raised area is approximately 90 square feet and it is on the average 2 feet deep with the sides built from red bricks faced with walling stone, the bottom filled with ¾" gravel to a depth of 6" and the rest filled with a so called "acid" sand recommended by an "expert" whose advice turned out to be very inexpert indeed for this sand was very fine in texture, low in humus content and developed a non-wetting characteristic. The location is southerly in aspect and shaded by the house, especially during winter when the area becomes cold and damp with very little sunshine.

These conditions did not suit many of the W.A. plants it was built to accommodate, namely, *Banksia, Isopogon, Petrophile,* etc. with the added disadvantage that during the summer months the sand, with its lack of humus, made water retention very limited to the detriment of the young seedlings and those other shrubs with surface feeding roots. Consequently this bed failed not in area or in drainage but in wrong soil (too fine, non-acid, poor humus content) and a poor choice of position (very little winter sun), but let's face facts, some areas of the average garden must suffer in this way.

The Third Area

This is a 16 foot curved ornamental raised bed made of red bricks 2' 6" high and 1' 6" wide open at the bottom to the parent soil and facing north. It is filled with a mixture of sharp sand and compost material which gives excellent drainage plus plenty of humus and no signs of a non-wetting surface but still failures occurred, mainly during the summer months when the red bricks became hot and the soil inside the raised area too warm and humid. These conditions did not suit *Prostanthera incisa, Grevillea thelemanniana, Hakea francisiana* but *Grevillea banksii* and *Hakea orthorrhyncha* held on and finally came good when their root system acclimatised and their foliage provided the "eaves" effect on the brick wall. The fault here is a bed too high and too narrow in a very sunny position and built of the wrong material—heat absorbing red bricks bonded with cement mortar, disastrous when the roots have a limited growing area and a dislike for alkaline conditions.

The Fourth Area

This area forms a rock garden of 150 square feet using natural weather-worn sandstone throughout in a dry walling technique to eliminate the effects

of the mortar used in the previous efforts. The position is sunny all through the year with broken shade from an *Eucalyptus torquata* more apparent in the summer months than the low sun position of winter. The area is tiered to a height of approximately 3 feet and filled with a mixture of sand and woodyard residue. This is the bark, fine wood chippings, leaves, soil etc. that is left after the mallee roots are stacked into storage heaps and it is then bulldozed into large piles in an odd corner of the woodyard where it stays for many a long year awaiting someone to buy it for garden mulch or the like. I checked two heaps of approximately 30 tons each and decided that the friable woody soil would be excellent material for a raised bed, hence its inclusion in the rock garden orea and thereby I committed an error of judgement.

The soil turned out to be alkaline (pH 8 to 8.5) which was not surprising as it came from the limestone areas of the South Australian "Mallee" and it also contained large areas of white mould and fungi, which not only continued to attack the dead wood chips but also started to gather on the roots of the seedlings planted with such high hopes in this newly raised garden.

To make matters worse it was deficient in nitrogen and sundry trace elements—altogether a poor choice of soil, consequently mediocre results were obtained despite a good position, natural rocks, good drainage etc.

The Fifth and Last Area (to date)

This area was given a great deal of thought and finally a sand plain concept resulted—rough stone dry walling was used to encompass most of the area, the clay sub-soil was given a slope sufficient to allow excess water to drain away to the low level side of the bed, sharp, coarse acid sand with a good humus content was used for fillling to a depth of 12 to 15 inches and the position chosen faced North with broken shade for roughly half of the day. The area is approximately 140 square feet making it small, but sufficient for quite a few native plants if one is prepared for a massed display sometime in the future.

This time all the factors seem to be right for *Banksia robor, B. baueri, B. ashbyi* and *B. repens, Anigozanthos manglesii, A. rufa, A. viridis* and *A. pulcherrima, Melaleuca pungens* and *M. fulgens,* as well as *Isopogon, Eremophila* etc. all seem to be progressing satisfactorily in this area although time alone will give the final answer.

I think it fitting to close with a few of the "do's" and "don'ts" which have taken me 5 years and a lot of effort to discover, so:-

1. Do use a suitable soil for your "required" condition.
2. Do make an effort to achieve good drainage, both in the type of soil and in respect of surplus water.
3. Pay attention to the sunlight position of the area—sufficient in winter but not too open in summer, especially if the shade temperature reaches 100°F (add approximately 50°F for sun temperature).
4. Use natural rocks or stone where possible, avoid cement and mortar—employ the dry wall technique.
5. Do not build tall thin beds; these tend to become hot and hence dry out quickly, also they restrict the roots of large shrubs giving rise to root wrench in high winds or storm conditions.
6. Lastly—do take notice of these notes, it will save you time and trouble and it will establish your native garden all the quicker.

WILDFLOWERS FROM SEED

PLANT PROPAGATION by Eric Chivers

The following describes the raising of plants from seed using vermiculite as a medium. Other people may prefer different mediums and obtain equally good or even better results, but we have found vermiculite quite suitable provided the seedlings are transferred to their eventual containers as soon as possible after the first pair of true leaves—not the cotyledons—have formed.

Containers for seed raising should not be more than four inches deep, but they can be any area. At present we use 24" x 16" wooden trays 3½" deep, which are divided by galvanized iron strips into 40 compartments roughly 3" x 3". These have the advantage of keeping the groups of seedlings in compact groups, but this system also has a disadvantage. Some seeds are slow in germinating, which means that a whole tray could take up valuable space just because of a few stubborn seeds. In the coming season, we intend to switch to pots 3½" square and 3½" deep. These will be much more convenient, and enable pots seeds to be packed together.

Whatever your container, it is necessary to crock it, and ¼" gravel is used for drainage. This is covered with a thin layer of sphagnum moss, seaweed or similar material, to prevent the vermiculite from entering the drainage material. Pre-soaked vermiculite is then added, lightly pressed, and levelled off to within ½" of the top of the container.

Seed is distributed in a single thickness over the surface, and if fine, the seed should be lightly topped with dry vermiculite. Don't oversow, otherwise seedlings will become overcrowded. The whole is then lightly covered with a mulch of ⅛" white gravel because this has an acid reaction. Blue metal chips are considered to be unsatisfactory because of their alkaline nature. It might be pointed out here that all mediums used should be neutral to slightly acid for the best results. Once the seed is sown, water with a fine spray as often as the weather dictates. A coarse spray should be avoided for obvious reasons. Remember, too, that vermiculite holds the water well, and, therefore, should not be overwatered.

Seed in many cases, can be sown from August to October or in early autumn. All leguminous seeds should be soaked before sowing—some say overnight. We have found that near-boiling water poured over them a few minutes before sowing is just as satisfactory.

There are many types of containers and mediums into which to prick out seedlings, but we have stuck to wooden veneer tubes. These are made from 12" x 6" veneer sheets which we wind round a 2" pipe and fasten with two heavy-duty staples. The resulting tubes are therefore 6" high and 2" across. If you are only pricking out a few seedlings, the tubes can be filled with the help of an old jam funnel.

The soil mix we use is two parts bush sand, one part grit, one part peatmoss, and one part of ⅛th white gravel. The peatmoss, which is first soaked for some days and then squeezed out, holds sufficient moisture to ensure the correct degree of dampness for the completed soil mix. The texture of the mix must be such that a handful, taken and squeezed into a compact lump, will fall apart when touched with the finger.

When the tube is first filled, the soil is tamped down very firmly. This is important, as it ensures that in the event of the tube being shifted in the early stages, the soil will remain inside. At this stage we have a half-case ready, lined with black plastic on the bottom and sides to retain the moisture. The half-case, which holds 45 tubes, has about ¼" of coke-breeze placed in the bottom to provide drainage, and to ensure that the soil is not sucked out of the base of the tube, as can happen when the tube is placed on a flat surface. After the first tamping of the soil, further soil-mix is added to the tube, pressed down firmly by hand to within ¼" of the top, and the filled tube is then placed in the case.

The soil in the tube is dibbed with a rather slender dibber, which is also used to remove the plant from the seed box. The plant is carefully introduced into the hole at the stage when the first pair of true leaves have formed—the root system at this stage being fairly easily handled with little likelihood of damage.

The soil is then lightly pressed into place and covered with a mulch of ⅛" gravel. As soon as the pricking-out is completed, the cases are put into the shadehouse for a few days, and when a suitable mild day occurs, they are removed into full sunlight, with shelter in the form of shrubs on all sides, but open above.

Having settled the seedlings down, it is necessary, because of the nature of the soil used, to spray fortnightly with "Aquasol", or other foliar spray, taking care that the mixture is correct. It is also necessary to inspect the seedlings every few days for leaf rollers, loopers etc., especially in Acacias. A weekly spray with a pyrethrum-based general garden spray will take care of most "wogs".

Many will say that the veneer tubes are not satisfactory because of the excessive drying-out, but we have found that the plastic lining with the possible addition of a thin layer of newspaper inside that, retains the moisture sufficiently. Watering can be restricted to once every three days, or every two days in very hot weather. An easy way to check is by lifting one tube out and feeling the soil for the degree of moisture.

The great advantage of using veneer tubes is the ease with which plants can be transferred to the garden. It is a simple matter to remove the staples and gently unroll the veneer in order to free the soil from the sides of the tube. One thickness of the veneer is left around the soil for the moment to prevent root damage. The plant can now be lowered into an already-prepared hole, and finely broken-up soil gently pushed up against the veneer. When it is entirely surrounded by soil, the veneer can be lifted out, and the soil carefully firmed around the plant.

CARNIVOROUS WILDFLOWERS

There are some fascinating wildflowers, usually small plants such as *Drosera*, that prey on insects. Readers wishing to join a study group on these plants should contact Mr. Stephen Clemesha, 18 Wesson Road, West Pennant Hills, N.S.W. 2120.

SPECIES OF PLANT FAMILY AMARYLLIDACEAE

Mrs. Roslyn V. Mutton, 63 Bond Street, Mosman, N.S.W. 2088, is making a collection of all species in this plant family. These are referred to in our No. 26 issue, Vol. 3, page 259. Will readers who can help with seed and bulbs please contact with her direct. By people with a similar interest corresponding, we could have a very interesting study group.

HERBACEOUS PERENNIALS—Continued from page 289

Propagation

Those who have collected seed in the wild know the difficulty of obtaining seed which is not damaged by insects. Much of the seed is usually infertile, therefore care must be taken when collecting seed. To check insects, a small quantity of paradichlor-benzene should be enclosed with the seed in a bag. By the time the seed is brought home and cleaned the fumes from this chemical should have destroyed any insects.

Cuttings are rarely available but wherever possible attempts can be made to grow plants from these. Stout, short, shoots arising from the crowns (often situated many inches below ground level) should be removed with portions of the crown attached. These cuttings can be planted in a 50/50 peat/coarse washed sand mixture and placed under glass. Given adequate care and attention some success will usually be achieved. So far as is known no work has been published on the effects of using hormones on cuttings of this type.

In addition to stem cuttings, root cuttings can be tried in a number of cases. In the first instance where it is noted that damaged roots, or those exposed through erosion, have produced shoots along them, these will usually produce adventitious shoots if portions of the damaged shoots are placed vertically into the above soil mixture.

Wahlenbergia is a case in point and although seed is usually available these will reproduce successfully from root cuttings.

Cultivation

Bearing in mind the facts raised earlier, many of these herbaceous plants can be more easily grown in large and deep containers, or in prepared soil pockets in a rock garden or on terraces, than placing them into the "ordinary garden soil". Little is known of their reaction to fertilisers, even such mild ones as blood and bone and organic; but it should be remembered that many Australian species react unfavourably to phosphate. Where chlorosis occurs, and it is possible to determine the trace element causing this, then a weak foliar spray should be applied in an attempt to correct the deficiency.

List of Species

As with general garden herbaceous perennials our native species are often in plant families which are either limited to herbaceous plants or have woody members also. Of those found in South Australia the outstanding family is Compositae. Other families having such species include Leguminosae, Amarantaceae, Goodeniaceae, Labitae, Campanulaceae, together with some monocotyledenous groups (including grasses), also ferns.

Grasses

Not enough attention has been given to the beauty of our grasses when in flower, or in leaf only. Many of the northern genera would prove most difficult to cultivate, principally because of climatic and soil requirements. There are three genera of grasses native to South Australia which should be cultivated, *Themeda* "Kangaroo Grass", *Stipa* "Spear" or "Corkscrew Grass", and *Chloris* the "Umbrella Grass". The flower spikes and seed heads of all the species of these genera are attractive and will add greatly in appearance to the woody plantings of native plants. *Spinifex* in coastal regions is always attractive although little attempt has been made to cultivate it. It should be pointed out that the plants are unisexual and therefore to obtain viable seed plants of each sex are required. The name of this genus should not be confused with Porcupine Grass *(Triodia)*, which has not yet been grown successfully.

Ferns and Allies

Of the fern species found in South Australia, two genera are distinctly perennial in nature—*Ophioglossum* (Adder's tongue) and *Botrychium*—while there are many species of other genera which show this habit. Species of *Cheilanthes* "Rock Ferns", *Notholaena, Gymnogramme, Anogramme* and *Pleurosurus* produce fronds during the period of rain, but in the hot dry season these deciduate. Under more congenial conditions fronds will remain throughout the year but these groups could be considered under the general heading of herbaceous perennials.

Of the fern allies only two genera need to be mentioned, *Marsilea* (Nardoo) and *Isoetes* "Quill Wort". The former can maintain sterile fronds permanently, but again under harsh conditions the root stock only will remain until further rains arrive.

Bulb, Rhizome or Corm?

Most species of Liliaceae, Iridaceae and Amarallidaceae and related families have as a root stock either a bulb, a rhizome or a corm, or form a compact root crown. These have already been described, together with other plants possessing this type of root stock in "Australian Plants" (Vol. 5, No. 38 March 1969).

The species of the genus *Dianella,* although usually possessing some permanent foliage, could be regarded as herbaceous perennials. They are all very attractive with blue flowers and often blue globular fruits. Likewise the genus *Lomandra* and *Stypandra* should not be overlooked, but these have permanent leaves and stems above the ground.

Laxmannia (Bartlingia) is a Liliaceus genus of about eight species which can be included. Usually small growing, they produce wiry stems, leaves in tufts and crowded and somewhat insignificant flowers. The growth form, however, is quite attractive.

Pussytails

It is a great pity that no attempts have been made to grow *Ptilotus (Trichinium).* Many of the species are truly herbaceous perennials of varying heights with leaves of various shapes. The flowers are in dense conical heads and are usually brightly coloured. Generally they are called "Pussy Tails" and in colour vary from white, through cream and yellow, to shades of pink and red. The finest and most spectacular is probably *P. exaltatus* which reaches two feet in height in good seasons. The leaves are large and broad and the heads of flower up to three inches long are usually pinkish in colour.

Other species worthwhile attempting to grow would include *P. helipteroides* with bright pink flowers, *P. nobilis,* flowers yellowish-green, *P. macrocephalus* where the flowers are similar to the last-named species. *P. exaltatus* v. *semilanatus* has bright red or deep pink flowers while *P. spathulatus,* which is often dwarf growing with some prostrate stems, has greenish brown flowers.

Under natural conditions, and if the season is dry, no above the ground growth occurs whatsoever, the root stock lying dormant.

There are other species as well but all members of the genus make worthwhile garden plants if they can be induced to grow in gardens. Most grow in rocky semi-heavy soil, but what is more important, dry sites and always in the full sun. Seed is the best method of introduction, or very young plants.

Editor's Note—Our next issue will present dry area plants. Notes on your experiences with their cultivation are needed. *Ptilotus* are of special interest and reports of members' experiences with their propagation and cultivation are needed.

Small Perennials

The two species of *Boehavia* found in South Australia are both worth cultivating. *B. diffusa* is a small prostrate perennial with wiry jointed stems. The leaves are small and the solitary flowers, pinkish and small, occur (also in umbels) along and at the apex of the stems. *B. repanda* is a scrambling robust species with larger cordate leaves and heads of bright pink or purplish campanulate pink flowers up to half an inch in diameter. Both of these require well drained sites.

Turning for a minute to the vegetable patch *Tetragonia expansa* "New Zealand Spinach" or "Warrigal Cabbage" is a very useful "green". The stems are prostrate and covered with a bright green succulent thick leaves. It is often grown as a culinary herb. The flowers are small and bright yellow, the leaves and young tips are cooked and eaten like spinach.

For those interested in plants for around a pool, or a bog garden, *Claytonia australasica* is excellent. A creeping perennial with underground stems, the long narrow leaves make an attractive feature in themselves. Flowers are in loose racemes, are small, star-shaped and white in colour.

One of our brightly flowered succulents, *Calandrinia polyandra*, "Parakeelia", is often classed as an annual, but well grown specimens produce a perenniating root stack. It grows up to twelve inches in height with flattish and fleshy greenish-red leaves which are up to two inches long. The open and almost flat flowers are produced in terminal spikes at the end of the growths and are usually bright purplish, or purplish pink, in colour. It needs acid sand or light soil to thrive and a full sunny position. It makes an ideal rock garden plant.

Both *Sagina procumbens* and *Stellaria pungens* are useful plants with white flowers. *S. pungens* has short erect stems with rigid pointed small leaves and the flowers are produced along and at the end of the stems. They are usually white but sometimes pink in colour and are star-shaped. Another plant of similar habit is *Scleranthus pungens* which also has white flowers.

Buttercups

The Buttercups should not be overlooked. Both *Ranunculus aquatilus* "Water Buttercup", and the related species *R. rivularis* make useful pond plants. The common Buttercup *R. lappaceus* produces large, bright yellow flowers in profusion during the spring and early summer months and will grow freely in good garden soil which is liberally supplied with water.

Legumes (Pea Flowers)

Although many of the Leguminosae are grown as trees and shrubs, this family possesses a number of herbaceous perennials all of which are worthy of cultivation, but most are very difficult because of the culture they demand. Many of these species are from arid regions and therefore demand a light well-drained acid soil to grow them successfully.

The two South Australian perennial species of *Crotalaria* need deep sandy or well drained soil which is acid in character. *C. mitchellii* is a silky pubescent plant having a single leaflet and moderately large green flowers produced in terminal racemes. *C. dissitiflora* will reach up to three feet in height with three narrow leaflets and yellow flowers in a long raceme.

There are three species of *Lotus*, "Birds Foot Trefoil", which can be grown. *L. australis* is robust-growing with greyish foliage and either white or pinkish large pea-shaped flowers. *L. coccineus* is much smaller, often prostrate, with reddish green foliage and heads of small reddish or pink flowers. *L. corniculatus*, the common "Birds Foot Trefoil" is also somewhat robust growing and can be either prostrate or ascending. This species has bright green leaves and heads of bright yellow flowers.

The Psoraleas are robust growing and usually erect plants up to 4 feet high with deep green trifoliate leaves arranged around the tall stems. Numerous small pink or purple flowers are produced in terminal spikes. All the species need well-drained but moist conditions to thrive.

A group, some members of which have been in cultivation for a long time, is the *Swainsona* or "Darling Pea". It is a large genus, the majority of the species are worthy of cultivation but need careful handling, primarily because they come from low rainfall regions but usually in areas where some run-off of water is available. Both *S. greyana* "Darling Pea" and the related New South Wales species, *S. galegifolia,* are outstanding erect growing plants up to 3 ft. high with numerous terminal spikes of pink or rose-coloured flowers. There is also a white form of the latter species. *S. procumbens* "Broughton Pea" is usually prostrate with racemes of comparatively large bluish-purple flowers. *S. stipularis* produces heads of orange, red or brownish red (rarely pure yellow) flowers in profusion in both axillary and terminal racemes. *S. flavicarinata* has greyish green foliage; the stems are prostrate, along which are produced reddish yellow flowers in erect racemes.

Seed is readily available in the field and this can be sown in spring. All species are attractive, but because of their natural habitat are somewhat difficult to cultivate. In the main they need well-drained sites in the full sun, but many require acid sands.

The most spectacular of the leguminous perennials is "Sturt Desert Pea", *Clianthus formosus.* Usually regarded as an annual, because it is treated this way in cultivation, it is an effective perennial if the root crowns are successfully carried on from one season to another. It is subject to collar rot and therefore should have a coating of gravel around the base of the plant. It requires a well-drained position in full sun, but the soil should be a mixture of fine sand and a little clay.

The prostrate stems, the grey pinnate foliage which is covered with silky hairs, form an attractive backdrop to the large drooping flowers which are produced on an erect stem. These are usually blood red with a central black boss, but colour forms without the black colouring, through pink and red, even to white, are known and recorded. It is usually raised from seed.

Another legume which makes a bright display is *Kennedya prostrata,* "Scarlet Runner" or "Running Postman". The greyish green prostrate stems bear large trifoliate leaves from the axils of which one to two large scarlet flowers are produced. It is suitable for the rock garden or carpeting ground in slightly shady positions.

Glycine has twining stems, at the apex of which are produced short racemes of bluish flowers. It has greyish trifoliate leaves.

Geraniums

Within the group generally called "Geraniums" there are several perennials which make useful rock garden plants. *Geranium pilosum* has somewhat prostrate stems and the leaves are small, roundish and notched. The flowers are usually pink or white. *Pelargonium australe* is a stout sub-erect plant with reniform hairy leaves and heads of pink flowers, streaked a darker shade or purple. It is a plant found under a wide variety of habitats, including coastal regions.

Stackhousia

The small-growing *Stackhousia* is worth attempting to grow. *S. monogyna* has erect glabrous stems up to 12 or 15 inches high with terminol spikes of numerous small creamy-white tubular flowers; it prefers partial shade. *S. spathulata* has somewhat prostrate stems with ascending tips, thick leaves

and dense spikes of small white flowers. It naturally occurs in sheltered sites near the coast and worth attempting as a rock garden plant.

Violets and Loudonia

It is a pity that more gardeners do not grow the native violets. They can be used for carpeting in shady areas, in the rock garden, between paving stones or on dry walls. The largest flowering species, *Viola hederacea,* has attractive pale green reniform leaves and produces attractive violet or pale purple and white scented flowers over a long period of time. Much smaller growing is *V. siberiana* while *V. betonicifolia* lacks the stoloniferous habit. The leaves are produced in a basal rosette, broad lanceolate in shape, and the purple flowers are most attractive.

The brilliantly yellow-flowered *Loudonia,* "Golden Pennant", comes from sandy areas and low rainfall regions, frequently from limestone areas. If attempts are made to grow it, it should be tried in a well-drained sandy site. The plant is erect growing, glabrous, with narrow leaves and heads of bright yellow flowers.

Pennyworts

Many of the *Hydrocotyle,* "Pennyworts" are useful garden plants although not spectacular. The foliage is attractive, usually circular in outline. The flowers, which vary in colour from a yellowish green to a cream, are often hidden under the foliage. All need moist and semi-shaded positions. In contrast the Eryngiums are rigid and erect growing plants, often with bluish sharp-pointed leaves. The flowers are bluish coloured and in globular heads.

Water Plants

An easily grown and handsome water plant is *Villarsia exaltata.* The leaves are ovate and glabrous; the showy yellow flowers are produced in erect panicles and it is an ideal water plant, or bog garden plant. Another aquatic is *Limnanthemum crenatum* which has floating stems, roundish leaves and heads of bright yellow flowers. There are several species in each genera, each of which would be an interesting plant to grow.

Miscellaneous

Although exotic species of *Convolvulus* and related genera are often troublesome weeds, *C. erubescens* is an attractive prostrate hairy perennial with oblong leaves and produces numerous pink flowers along the stems.

There are several *Teucrium* species found in South Australia which are perennials. Usually hairy, up to 18 inches high, they form handsome plants with opposite lobed foliage and clusters of white flowers in the axils of the leaf. The native mints, *Mentha,* is another group which can be grown, although perhaps not as spectacular as the many exotic species now in cultivation.

A useful plant for growing in the rockery or amongst paving stones is *Prunella vulgaris,* "Self Heal". Often reaching 18 inches in height it has reddish-green leaves with bluish to purple coloured flowers which are crowded into terminal spikes. More spectacular and equally useful is the "Austral Bugle" *Ajuga australis.* This perennial has a rosette of greyish oblong lanceolate leaves from the centre of which rise spikes of bright blue or purple flowers. This is a most attractive plant and because it is amenable to cultivation it is surprising that it is not more widely grown.

Another group which is rarely cultivated is the "Native Tobacco", *Nicotiana* spp. All have longish and usually viscid leaves with heads of tubular white flowers, some of which are scented, but all are most attractive.

The so-called "Monkey Flowers", *Mimulus* have a few species which are worthy of growing. *M. repens* which inhabits marshes and creeks is small and prostrate. It produces numerous small purple flowers between the

greenish-red foliage. The "Blue Top", *Morgania glabra* is a robust, erect-growing plant often 3 ft. high with bright green leaves and tall spikes of clear blue flowers. Like *Mimulus*, it prefers a moist situation.

A most attractive and compact plant is *Rostellularia pogonanthera*, perhaps better known as *Justicia procumbens*. From the root stock short erect stems arise with small lanceolate leaves. The flowers are pinkish in colour and are borne in terminal spikes. It would make an ideal rock garden plant and is also suitable for planting in dry walls.

Very few South Australian plants form dense mot-like growth but *Dentella pulvinata* is one. Usually found near rivers or streams it forms cushion-like plants up to a foot across, or even more. The small white stor-shaped flowers make an interesting display in season.

Blue flowers are always appreciated, therefore the various species of *Wahlenbergia* should be freely grown. Many have large and colourful flowers and one interesting species—*W. gloriosa*—found in the Australian and Victorian Alps makes spectacular displays of large blue or almost purple flowers. Other species are all attractive and usually flower for many months at a time. They can be easily raised from seed or propagated by root cuttings.

Two other groups have blue flowers, namely *Lobelia* and *Pratia*. *L. alata* is interesting because of the angled or ridged stems along which small blue flowers occur. The *Pratia*, like *Lobelia*, are useful plants for moist places.

Goodeniaceae

The blue "Pin Cushion", *Brunonia australis*, is a beautiful little plant reaching up to 12 inches high. The leaves are radical, hairy and broad. At the top, on thin stems, a head of bright clear blue flowers is produced during the spring and summer months.

Another group with blue flowers is *Dampiera*. Most of the species are from Western Australia but there are several from South Australia, and one is an attractive perennial. *D. lavandulacea* "Wild Rosemary" has white stems and leaves and produces an abundance of blue flowers in heads during the spring months.

Although rarely grown, there are many species of *Goodenia* which would be ideal for the rock garden, or carpeting areas. All are tufted perennials with bright green or greyish leaves in the form of a basal rosette from the centre of which arises bright yellow flowers on short stems. Most are low growing, but an exception is G. *albiflora* which is somewhat erect with angular stems and has white flowers. The species of the related genus *Velleia* are also attractive and would be worth introducing into cultivation.

Another attractive group is the "Fan Flowers" or *Scaevola*, although these have been rarely grown. Usually prostrate with hairy leaves, the flowers are produced in heads or along the branches. In the shape of a fan the flowers are usually a shade of blue, lilac or purple, and because they are free flowering over a long season would make wonderful rock garden plants.

Trigger Plants

The "Trigger Plants" are also rarely grown. Interesting because of the irritable column, the genus *Stylidium* has several perennial species which are worthwhile cultivating. The common "Trigger Plant", *S. graminifolium*, reaches about two feet in height. The narrow leaves form a basal cluster from which arises the tall flowering spike with pale to deep pink flowers. The plant flowers for long periods from spring through the summer.

The local species, *S. tepperianum,* is found only in Kangaroo Island. It has short red stems which are surounded with tufts of small narrow green foliage at intervals. The flowering spike is slender, reddish and bears up ot six or eight deep pink flowers.

Amongst the species of the genus *Brachycome* there are many perennials. *B. ciliaris* is an attractive erect growing plant up to 18 inches high with divided leaves and white or violet flowers about an inch in diameter. *B. graminea* has a creeping root stock from which tall stems arise. These are clothed with smooth simple long narrow leaves and the flowers vary from pink, white to a bluish pink. Other bright species are *B. trachycarpa* which has lilac flowers and *B. tatei* which is found near the head of the Bight and has thick, simple lobed leaves which are stem clasping, and lilac flowers.

Possessing a number of colourful flowering plants, the Australian genus *Minuria* is widespread throughout the drier parts of Australia and species are found in all States except Tasmania. The flowers vary in colour from white, to pale pink, lilac, violet and even yellow or purple. In appearance they are like small English Daisies *(Bellis perennis)* and cover the plant.

M. leptophylla grows up to 20 cms. high, with numerous branches, hairy below, glabrous above. Leaves are long and thin. Flower heads on the ends of branches are pink, or violet and sometimes purple or white, about 1-2 cms. in diameter. *M. cunninghamii* has rigid branches, narrow leaves, and white heads of flowers, whilst *M. rigida* is a somewhat sparse erect small growing plant usually glabrous, with semi-opposite lanceolate sharply pointed leaves. The flower heads are pale lilac to pinky lilac in colour. *M. suaedifolia* is widespread in the drier parts of Victoria, New South Wales, South Australia and Western Australia. Stems—8-20 cms. high—are often woody at the base. Leaves are narrow and short, with a recurved sharp tip. Flower heads are small and yellow in colour.

Nearly all the species of *Calotis* have bright yellow daisy-like flowers, but one or two have white or bluish coloured ones. The plants are usually bushy, often large, with bright green usually lobed leaves. A great number of the species can be found in rocky or sandy areas in the northern part of the State, therefore if attempts are made to grow these (they can be raised from seed) they need well drained sites of lightish soil in the full sun.

C. erinacea forms large rounded bushes up to 30 cms. high, with bright green foliage and almost golden yellow flower heads. *C. scabiosifolia* is usually found in higher rainfall regions as a hairy stoloniferous perennial up to 30 cms. high, with white to bluish flower heads. *C. kemperi* is tall growing, with erect stiff branching stems, with prominent bright yellow flowers.

An attractive, small growing and compact species is *Vittadinia triloba.* It is a variable plant with greenish grey to grey lobed foliage. The flowers are small, usually purple or violet (rarely white or pink).

Several species of *Cotula* are interesting plants although small growing. *C. coronopifolia* is an attractive bright green low growing plant with weak stems, at the apex of which are small billy button heads of bright yellow flowers up to half an inch in diameter. It likes boggy or wet sites.

The "Bear's Ear", *Cymbonotus lawsonianus,* is an unusual plant because it is stemless; the long broad leaves are toothed, green above and white beneath. The heads of flowers are solitary on short stems, bright yellow in colour and up to one inch in diameter.

The genus *Pterigeron* is endemic to Australia and comprises a number of annual and perennial species found throughout the drier parts of the continent. *P. liatroides* is a rigid and erect perennial up to 35 cms. high, covered with short curly hairs and oblanceolate slightly toothed leaves up to 4 cms. long. Flower heads about 1½ cms. long, usually purple or pink in colour. *P. adscendens* is a hairy perennial, stems prostrate or ascending usually woody at the base. Flower heads numerous, purple, and smalled than the above. *P. cylindriceps* is often found as an annual but frequently has what appears to be a substantial rootstock. Stems erect up to 20 cms., and hairy, with leaves ovate to cuneate. Flower heads comparatively large usually purplish in colour, usually on short leafy stems.

Amongst the best known of the Compositae are the various "Straw Flowers" or "Everlastings". The two genera involved are *Helipterum* and the closely related *Helicnrysum*. Most of the former are annuals, but amongst the members of the genus *Helichrysum* there are numerous attractive plants some of which are already in cultivation.

Although *Helichrysum bracteatum*, "Straw Flower" is usually grown as an annual (in one of the many coloured forms now available) under natural conditions it is a robust-growing perennial up to three or four feet high. The green, somewhat long and narrow leaves clothe the stems, which produce numerous flower heads at their apex. The flowers are often an inch or more in diameter, bright shining yellow, often tinged with reddish brown. In the full sun plants of this species make a spectacular display, and as they tolerate a variety of soil types can be widely planted. There is a sub shrubby form "Dargon Hill Monarch" from Cunningham's Gap, Queensland, which has bright yellow flowers up to 2½ inches in diameter.

H. leucopsidium is a greyish white woolly plant with narrow leaves and heads of white to pinkish flowers. It prefers partial shade. Another species which is covered with a dense velvety white tomentum is *H. blandowskianum*. The flowers are in dense terminal bunches and are white in colour.

H. scorpioides, H. apiculatum and *H. semipapposum*—see page 288.

Other species which are perennial include *H. baxteri, H. obtusifolium* and *H. ambiguum*, but so far as is known no attempts have been made to cultivate these species.

The genus *Ixiolena* has three species, all of which are perennial, with entire leaves and terminal heads of small flowers. *I. supina* is a coastal species, almost prostrate, and forms attractive mats, especially when in flower.

One of the many "Billy Buttons" is *Leptorrhynchus*, which produces small bushy plants up to 18 inches high. They have narrow leaves which are usually green and produce heads of yellow or orange coloured flowers on long wiry stems.

The group to which the name "Billy Buttons" is more often applied is *Craspedia*. In South Australia only a couple of species are usually perennial, including C. *uniflora*. In this species the leaves are radical, long and flat, often clothed with silky hairs, and from the centre of the plant arises a tall erect stem at the top of which is produced almost globular heads of yellow flowers. In alpine districts in other States there are colour variants; the plant is often very much more hairy and flowers will grade to almost pure white.

A group with large and brilliant flowers is *Podolepis*. The best known is *P. rugata* which is almost like a sub shrub, reaching up to 3 ft. in height and is almost glabrous. The leaves are long, narrow and deep green in colour. Terminal heads of bright yellow flowers are produced in profusion, making it a most attractive plant when in flower.

Many of us grow the coastal "Cushion Bush", *Calocephalus brownii* for its silvery white foliage. The genus also has a few annuals and several perennials, including C. *lacteus*, with heads of white flowers. C. *citreus* has compound heads of bright yellow flowers, while C. *multiflorus* "Yellow Top" has heads of bright yellow or almost golden coloured flowers.

Although there have been few attempts made to grow many of the plants described herein, this list has been prepared to draw attention to the many valuable, interesting and attractive plants which have good potential and are found amongst the perennial species of our South Australian genera. It is hoped that during the coming years many will be successfully introduced so that the variety of Australian plants cultivated will be greatly increased.

SUN ORCHIDS

THE SOUTH AUSTRALIAN ORCHIDS *by R. C. Nash*

The Sun Orchids *(Thelymitra* Forst. f.), are so named because their flowers usually open only in bright sunlight or on very warm days. South Australia probably has only 14 species in this genus, there does appear to be up to eight other plants that could well be hybrids, making a probable total of 22 naturally occurring plants. Only a few species and hybrids have been successful in cultivation. Several species are easily grown from seed and it is suggested that this method of obtaining plants be tried, plants from other scources should be acquired with care and caution. If plants ore obtained from other than seed then only one or two should be tried, as if one is successful then they will soon multiply vegetatively.

Cultivation—In cultivation these plants have shown a preference to a very sandy, well drained compost with a very low humus content. Potting, the major volume of the pot is filled with clean coarse sand e.g. a sharp gritty sand well washed. Broken pieces of pot or similar material should first be placed at the bottom of the pot to improve the drainage. A layer of an inch or so of the following compost is placed on top of the sand to fill the pot, five parts of clean coarse sand mixed well with one part of rotted Red Gum *(Eucalyptus camaldulensis),* or other Eucalyptus species, buzzar chips or rough sawdust. The seedling tubers are placed to a depth of three quarters of an inch to an inch below the surface.

During the growing period the plants require a moderate amount of direct sunlight, 50/50 sun to shade. The compost should be kept damp but not over damp while the plants are growing. When the flowers are about to open the plants may be shifted to a sunnier situation, this will aid in opening the flowers to their fullest, the only way to fully enjoy them.

While the plants are dormant in summer, keep the pots dry, watering could cause the tubers to rot out. If the pots do become wet, store them in a cool place till they have fully dried out.

Propagation from Seed—In collecting seed for growing, select healthy plants and only pollinate one or two flowers per plant. Always pollinate the same plants in a species, leave the hybridising to nature until well experienced in growing these plants from seed.

The seed is collected into paper bags at the time of ripening and should be allowed to thoroughly dry out by placing the bags out in the sun for a day or two, when it may be stored or planted. Several methods are now available to be tried in growing the Sun Orchids from seed. The first method uses the sterile agar mediums (see Mrs. Kowald's article and others). A second method, which needs the same sterile conditions as the above, is to sterilise by steam some old compost mixture. About one inch or so of this compost is placed into plastic cream containers and the compost dampened down with boiled rain water. The seeds are scattered upon the compast and the container's open top is sealed with a sheet of plastic held down with a rubber band or tied securely with string. A small amount of boiled rain water may be added from time to time as required taking care not to introduce any contamination. The containers should be kept in a shady area with ample indirect sunlight. When the small plants go dormant for the first time they should then be planted out into a prepared pot.

The third method needs a pot to be prepared one year in advance, this means a pot should be potted up in about September and watered etc. as normal until 15 months have passed. At this time (mid summer) the seed should be lightly scattered over the surface and lightly scratched in. Stand the pot in a cool shady area and leave undisturbed, till the following August when the first seedling may show through, some times it takes two or more years before the seedlings are seen. Plants will flower from two to four years after germination.

Fertilizer—There has always been a difference of opinion on the value of fertilizers when used on this genus. In the author's experience, a light spraying of Urea plus once a month in the growing period does not seem to be harmful and does seem to assist seedlings. One N.S.W. grower has used a weak solution of liquid fowl manure with good results.

Pests—Slugs, snails and caterpillars are the main pests experienced with these plants. A weak solution of Arsenate of Lead sprayed on the leaves if pests are visiting the plants will act as a successful control. Do not spray more than is necessary. Slug and snail baits should be laid regularly.

Diseases—Several fungi attack these plants at times. One that causes great distress rots all the leaves away. This disease usually starts with a small black spot that slowly gets larger. This disease is more prevalent during wet weather than dry. To control, spray with a plant fungicide, amputate the diseased part or shift the pot to a dryer spot. If the plants are sprayed, be sure to spray only the leaves and do not allow any spray to run down the leaves or stems, or to fall heavily upon the compost. The spray can kill the fungi that the orchid lives upon as effectively as the disease fungi.

Rust too, will attack these plants and once infected, the infection seems to pass from mother tuber to daughter tubers. It does not seem to cause any harm to either the plants or the flowers. No successful control has been found yet.

Another form of plant loss, caused by rot out, seems to come about when plants are excessively repotted. Once the plants are growing contently under a given set of conditions, it is inadvisable to repot unless crowding is causing distress. It is always better to tip the pot out and into a larger pot than to break up the contents.

The Species—The flowers of *Thelymitra* consist of three very similar sepals, in some plants the dorsal sepal may be a little wider than the lateral sepals, and inside these are the three very similar petals. No labellum is found in the flowers of this genus but the third petal, that is normally modified into this structure, shows only slight ornation in one species, *(Thelymitra venosa)*. The column however is highly modified and it is this structure along with colour that leads to the identity of a given plant.

In describing members of this genus I will first start with one of the commonest species which has a smooth top to its column and work through to a species with a very rough top to its column.

***Thelymitra pauciflora* R.Br.**

Distribution: Found throughout the better watered areas of the state, very widespread and variable with several types. (All other States & N.Z.).

Flowers during October and November, often never opening if the weather is at all cool. This species appears to hybridise freely with other blue flowered species in the genus and this may explain some of the variations.

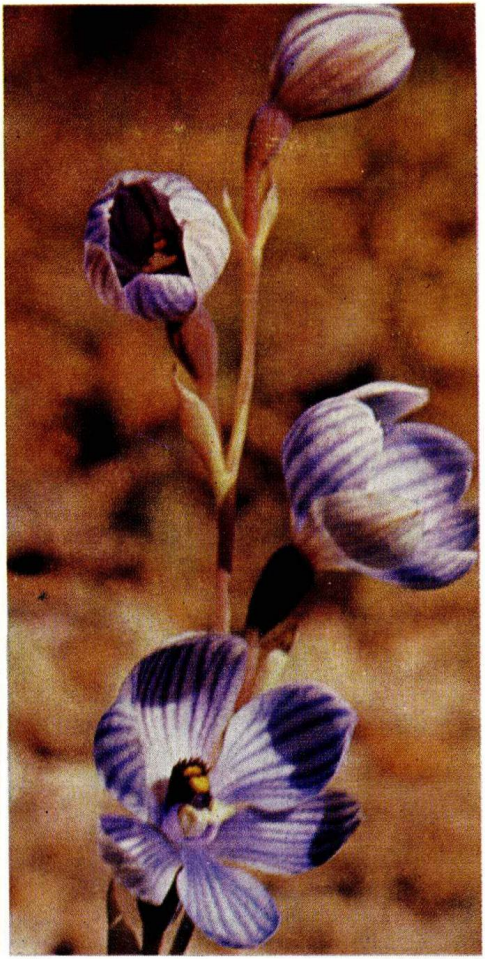
A moderately slender plant growing to 35 cm. in large specimens, average 25 cm., growing from medium-sized tear drop tubers 3 to 6 cm.

below the ground. Leaf slender lance like to 18 cm. long with a deep V shape in the cross section in most specimens. Two small leaf bracts are carried upon the flower stem and one below each flower. Flowers two to 12, blue, pale blue, white and pink to 2 cm. in diameter, self pollinating. Column of moderate length, mid lobe (the very top of the column) narrower than the body of the column, smooth topped, curved slightly forward with a tubular opening which is often deeply cleft to the rear. Side lobes (the small arms that carry the hair tufts) of medium length abruptly bent upward in most specimens, carrying white hair tufts pointing upward in a loose manner. Anther almost hidden by the stigma which more than fills half of the front opening. This species has been grown from seed by the author.



THELYMITRA ARISTATA

A form photographed by C. J. Winn
See over page



THELYMITRA CAMPANULATA

Photographed in Western Australia by R. Paynter

Editor's Note—It is proposed to describe all species of Thelymitra. Please send notes on species from your area if not mentioned here.

***Thelymitra aristata* Lindl.** (synonomous with *T. grandiflora* Fitzg.).

Distribution: From the southern Flinders Ranges to the southern Mt. Lofty Ranges, Kangaroo Island, south east. Although this species is widespread it is never over common in any one area. (Also S. Victoria and N. Tasmania).

Flowers during October and November. A beautiful sight in flower.

A very robust and tall plant growing to 100 cm., the tallest in the genus, produced from large elongated tear drop tubers 6 to 15 cm. below the ground. Leaf large, broad, grey green in the flowering plant, slender and dark green in the non flowering plant. Several large leaf bracts are carried upon the flower stem with one below each flower. Flowers 10 to more than 50, sky blue to pale blue 2 to 3 cm. in diameter. The column's mid lobe may be divided two or three times, bent forward with smooth or tattered edges, in the south east the mid lobe is short ending with bright yellow tips.

Side lobes long carried well forward not bent or if bent then only slightly, carrying very loose long white hair tufts which point forward and a little upward, a small yellow gland at the tip of each hair. Anther almost hidden by the stigma which fills less than half of the front opening.

This plant is not easy to cultivate, it is suggested that pieces of decayed material from one of the larger species of *Xanthorrhoea* Sm. be mixed into the compost and sand.

***Thelymitra nuda* R.Br.** (has until recently been erroneously called *T. aristata* Lindl.).

Distribution: Flinders Ranges, Mt. Lofty Ranges, Mallee Lands, Yorke and Eyre Peninsulas and other similar areas of the State, very abundant in some areas. (Found also in all other States as well as New Zealand).

Flowers in September through to November, the fully open flowers emit a very strong sweet perfume.

A plant of robust habit reaching to 40 cm. high growing from long tear drop tuber 3 to 6 cm. below the ground. Leaf grey green, broad and lance like to 25 cm. long, two leaf bracts are carried upon the flower stem with a small one below each flower. Flowers 2 to 12, pale blue to white, up to 3 cm. in diameter, sweet scented, not self pollinating. Column of moderate size, mid lobe inflated, smooth with a tubular opening with a prominent V notch at the top. Side lobes medium more or less point forward carrying short massed white hair tufts pointing forward and upward. Anther almost hidden by the stigma which fills half of the front opening.

Another plant the author has grown from seed.

***Thelymitra epipactoides* F. v. M.**

Distribution: Lower Eyre Peninsula, southern Mt. Lofty Ranges, lower Murray Mallee into the south east. Not common (Also west and coast Vic.).

Flowers during September and October.

A moderately robust plant reaching 50 cm. in height, growing from large elongated tubers 4 to 8 cm. below the ground. Leaf large pale green in the flowering plant, dark green flat and lance like in the non flowering plant. One large leaf bract at the base of the flower stem and one below the spike, a small bract is found below each flower. Flowers 5 to 20, ranging in colour from grey blue to bronze, 3 cm. in diameter. The column has the mid lobe divided into three minor lobes, the two side lobes carried forward, the middle one is more or less upright, edges of these lobes regular on Eyre Peninsula specimens and tending to irregular elsewhere.

Side lobes short bent upward carrying light coloured long irregular hair tufts pointing forward and upward. Anther almost hidden by the stigma which fills the lower half of the front opening.

A plant that may prove successful in cultivation if a little care is taken.

***Thelymitra luteocilium* Fitzg.**

Distribution: Eyre Peninsula where it can be locally common, Mt. Lofty Ra., Kangaroo Is., damper Murray Mallee and S.E. (Across Vic to N.S.W.).

Flowers during September and October. Needs a very warm day to open the flowers of this self pollinating species.

A slender plant that reaches 30 cm. growing from medium tear drop tubers 3 to 6 cm. below the ground. Leaf dark green, slender and lance like with a prominent V shape, two leaf bracts are carried on the flower stem and one below each flower. Flowers 1 to 5, pink approx. 2 cm. in diameter. The mid lobe of the column is smooth, tubular in snape with the open edges irregular, not formed into a prominent hood. Side lobes very short and broad carrying yellow upright hair tufts in a massive cluster. Anther extends to between the side lobes, stigma fills the lower half of the front opening.

A species that can be difficult in cultivation, likes a good sunny position, with almost full coarse sandy compost. Multiplies vegetatively in cultivation and will grow from seed.

***Thelymitra chasmogama* Rogers**

Distribution: Koppio on Eyre Peninsula where it was common, scattered parts of the Mt. Lofty Ranges. (Blue Mts. N.S.W., East and West Victoria).

Flowers in September to early October.

A plant of slender habit varying from 15 cm. to 30 cm. high growing from moderate sized tear drops tubers 3 to 6 cm. below the ground. Leaf dark green, slender lance like with a V shape, usually two leaf bracts are carried upon the flower stem with one below each flower. Flowers 2 to 8, pink through to smoky blue, 2 cm. to 2½ cm. in diameter. The mid lobe of the column is smooth with a tubular opening with a small V notch on the top edge, edges not very irregular. Side lobes very short and broad carrying short massive hair tufts spread before and below the opening of the mid lobe. Anther extends to between the side lobes, stigma fills the lower half of the front opening.

A plant that has responded to cultivation and in the author's opinion is a natural hybrid between *T. nuda* and *T. luteocilium*.

***Thelymitra carnea* R.Br.**

Distribution: Lower Eyre Peninsula near Koppio, Mt. Lofty Ranges at Cherry Gardens where it may now be extinct. (N.S.W., Vic. & Tasm.).

Flowers in September through to November.

A small slender plant to 15 cm. high growing from small tear drop tubers. The leaf is dark green and very slender, narrow and V shaped with one or two stem bracts upon the zig-zagged stem. One small bract is found below each flower. Flowers one to two, small pink to one cm. in diameter rarely reaching 2 cm. The mid lobe of the column has a tubular opening with a tendency to form two minor lobes, very irregular. The side lobes have no hair tufts but are very glandular, yellow and point upward. Anther protrudes above the top of the column, almost as long as the side lobes. Stigma low in the front opening.

***Thelymitra rubra* Fitzg.**

Distribution: Mt. Lofty Ra., Kangaroo Is. and the S.E. (N.S.W., Vic., Tas., King Is.).

Flowers during October and November, opening freely in warm weather.

The structure of this species is almost identical to that of *T. luteocilium*, the exception being that this plant may be a little slenderer with fewer flowers than the earlier described species. Flowers one to three, 2 to 2½ cm. in diameter. The mid lobe of the column is similar to *T. luteocilium* with edges more regular. Side lobes, short, hairless, yellow and irregular are

held high on the column. Anther large, the tip protrudes forward from between the side lobes and is covered with minute hair like glands. Stigma is situated higher than any of the previous species and fills the middle part of the front opening. A species the author has grown from seed.

***Thelymitra flexuosa* Endl.**

Distribution: Lower Eyre Peninsula, Mt. Lofty Ranges where it is now rare, Kangaroo Is., and the S.E. (Coastal N.S.W., Vic., Tasm. to W.A.).

Flowers during October and November and needs a very warm sunny day to open the flowers fully.

A very slender plant reaching a height of 15 cm. growing from small round to tear drop tubers, 3 to 6 cm. below the ground. The flower stem is very flexed in a zig-zag manner with a leaf bract at each bend, one bract is found below each flower. Flowers one to three, yellow to 1½ cm. in diameter. The mid lobe of the column is reduced greatly in size and huddles between the two side lobes which are not parted from the total structure except at their tips, tips slightly indented. Anther tip very large and prominent, produced forward and upward away from the column, covered with a velvet like surface. Stigma fills half of the front opening.

A plant that may prove successful in cultivation if grown from seed.

***Thelymitra antennifera* (Lindl.) Hook.**

Distribution: Throughout the better watered areas of the state, very common at times. (N.S.W., Vic., Tasm. and S.W. of W.A.).

Flowers in September through to November, the strongly perfumed flowers open very wide on a warm sunny day.

Another small slender plant, 5 to 15 cm. high growing from small tear drop tuber 3 to 6 cm. below the ground. The leaf is very slender and cylindrical in shape to 15 cm. long. The flower stem is very flexed as in the previous species, with a small bract at each bend and one below each flower. Flowers one to three, bright yellow on the inside, pink and yellow on the outside, almost 3 cm. in diameter. The column has no apparent mid lobe with the dark red side lobes produced high above the prominent anther, not unlike the ears of a rabbit. The sides of the front opening of the column fleshy and spread. Anther prominent, the tip protruding forward from between the bases of the side lobes, top covered with fine hairs. Stigma occupies much of the free space of the front opening.

***Thelymitra macmillanii* F. v M.**

Distribution: Mt. Lofty Ranges and now rare, the south east where at times common. (Central and western Vic., Tasm., S.W. of W.A.).

Flowers during September and October, flowers sweetly perfumed.

A plant of similar habit to *T. antennifera* but more robust with a semicylindrical leaf. Flowers one to three, bright pink, 2 to 3 cm. in diameter. The mid lobe of the column is reduced to an irregular structure between the two side lobes which extend high above the anther with very irregular glandular surfaces. Anther prominent, the tip protruding forward from between the side lobes and lower than the mid lobes, its surface minutely glandular. Stigma occupies the third lower part of the front opening.

In the author's opinion this plant is a natural hybrid between *T. rubra* and *T. antennifera*.

***Thelymitra urnalis* Fitzg.**

Distribution: A rare plant recorded from the Mt. Lofty Ranges.

Flowers October and November. A plant the author has not seen yet.

This plant is apparently very similar in appearance to a small *T. luteocilium* and has small flowers, brown red on the outside, yellow inside.

The column is short with very irregular edges to the almost non existent mid lobe. Side lobes very short and irregular. Anther large but does not protrude, stigma small and confined to the lower part of the front opening.

This plant is supposed to be a natural hybrid between *T. rubra* and *T. antennifera,* until I find and see one I reserve my judgment.

***Thelymitra matthewsii* Cheesman**

Distribution: A recently discovered plant for S.A., Christmas Rocks area in the south-east. May now be extinct due to the area having been improved lately. (Victoria and Armadale of Western Australia and N.Z.).

Flowers during September and October.

A short plant reaching 12 cm. high, with a twisted leaf not unlike a cork screw. The often single flower is dark blue to purple, about 2 cm. in diameter. The purple column's mid lobe ending irregularly with small circular glands on top. Side lobes yellow and produced above the mid lobe. Anther large, tip protruding, stigma filling lower half of the front opening.

***Thelymitra venosa* R.Br.**

Distribution: Recorded from the swamp lands in the districts of Myponga and Mt. Compass, becoming rare as the swamps are destroyed. Damp swampy areas of ranges of N.S.W., Vic., Tas., and N.Z.).

Flowers in December and often early January. A bright sunny day in mid December, during the late morning, is the best time to see in flower.

A slender plant 15 cm. to 30 cm. tall growing from medium tear drop tubers, 4 to 6 cm. below the ground. Leaf to 25 cm. long, narrow lance like with a deep V shape. Several bracts are found upon the flower stem, one below each flower. Flowers 2 to 5, blue with darker blue veinings, all white flowers have been found at odd times, 2 to 3 cm. in diameter. This is the only member of the genus in S.A. that has the normal labellum petal more modified than the other two petals. The mid lobe on the column is very inconspicuous and looks as though it were part of the anther. Side lobes are thin and flat, produced upward and forward the tips often curled inward on themselves. Anther large and prominent, the tip bent forward and out from between the side lobes, the pollen is carried under this forward projecting tip and often has fallen before the flowers open. The stigma fills the lower half of the front opening, a self pollinating species.

A plant that has not proved amenable to cultivation as it requires a very specialised habitat.

***Thelymitra fusco-lutea* R.Br.**

Distribution: Eyre Pen., Mt. Lofty Ra. and the S.E. (Vic and S.W. of W.A.).

Flowers during November and December, usually more prolific in the season after a bush fire has swept through the bush in the previous summer.

A plant reaching 25 cm. and growing from long narrow tubers 4 to 8 cm. below the ground. Leaf short and very broad, by far the widest in the genus in S.A., light green and up to 10 cm. long. Flowers 3 to 10, yellow covered with brown spots. The column's mid lobe ends in a small knob, the side lobes are broad with tattered edges. Between the mid lobe and the side lobes are a mass of small finger like appendages. Anther is not prominent, yet is longer than the stigma, which fills the lower one third of the front opening.

A most difficult plant in cultivation and not recommended.

***Thelymitra canaliculata* R.Br.** (synonomous with *T. azurea* Rogers).

Distribution: Recorded from many sandy areas, between Mt. Compass and Port Elliot, the Murray Mallee and south to the upper south east, along the Coorong, Eyre Peninsula where it also occurs in ironstone gravels. (Western Victoria, N.W. of Tasmania and S.W. of Western Australia).

Flowers in October and November, requiring bright sunlight to open the flowers fully.

A slender plant reaching 25 cm. or so, growing from long round tubers that have a crescent curve, carried horizontally to the soils surface. Flowers 2 to 12, blue, the tips of the sepals often dark blue to black. The column is blue with the mid labe almost black, carrying three yellow minor lobes, the rear one is semicircular while the other two are higher and on each side of the open top just above the side lobes. Side lobes short, projecting upward and forward carrying white tipped hair tufts. Anther long narrow, higher than the stigma which fills the lower half of the front opening.

***Thelymitra ixioides* Sw.**

Distribution: Mt. Lofty Ra. Kangaroo Is. and S.E. (All States and N.Z.).

Flowers during October and November, requiring a warm day for the flowers to open fully.

A plant of slender habit reaching almost 35 cm. growing from medium tear drop tubers, 3 to 6 cm. below the ground. Leaf dark green with a deep V shape, long and lance like, several bracts are carried upon the flower stem with one below each flower. Flowers 2 to 8. Blue with darker blue spots on the petals and dorsal sepal, app. 2 cm. in diameter. The column is short with a prominent mid lobe topped by two yellow raised rectangular segments in front and many finger like segments at the rear. Side lobes short, projecting forward, carrying loose white upward pointing hair tufts. Anther and stigma occupy most of the front opening.

This species has several possible hybrids.

***Thelymitra irregularis* Nicholls**

Distribution: A plant of rare occurrence in the Mt. Lofty Ranges, many of the locations threatened by clearing. (Central N.S.W., Coast Vic. & Tas.).

Flowers in October and November. The flowers open widely on a warm day and are most attractive.

This plant grows to about 30 cm. high, has a slender not deeply V'ed leaf. The flowers are pink with darker pink spots on the petals and dorsal sepal, app. 2½ cm. in diameter. The top of the column's mid lobe is covered with indentations and is very irregular and hooded. Side lobes, very short projecting out from near the top of the column, carrying short upward and forward pointing yellow hair tufts. Anther large and just hidden by the hair tufts. Stigma, occupies the lower one third of the front opening.

It is the author's opinion that this plant is a natural hybrid between *T. ixioides* and *T. rubra*.

***Thelymitra truncata* Rogers**

Distribution: Recorded from Myponga and may also occur in the south east. (Blue Mts. & Snowy Mts. N.S.W., A.C.T., Central Vic and N. Tas.).

Flowers in late October. The author has not seen this plant in S.A., having only seen it in the A.C.T. and in N.S.W. near Kiandra.

The general structure of plants observed were not unlike *T. pauciflora* with much larger flowers. The floral segments however carried the darker blue spots as in *T. ixioides* and the column was very short with an open top with slight indentations on the edges. Side lobes were short forward pointing carrying white hair tufts. Again the author considers this plant to be a natural hybrid between *T. ixioides* and one of the *T. pauciflora* types.

As well as the above possible hybrid, other plants that are obviously hybrids between *T. ixioides* and *T. pauciflora* have been found in various parts of the Mt. Lofty Ranges. In these plants the column's mid lobe ends with a tubular opening, sometimes yellow edged while at others it is brown coloured, higher than the hair tufts with a deep cleft down the rear of the

tube. This cleft needs careful examination to be seen. These plants must multiply vegetatively as they are often found in tight clusters and the seed seems to be mostly infertile.

Near Hahndorf another possible hybrid between *T. ixioides* and *T. nuda* has been seen. These plants often exceed 30 cm. in height being tall and slender. Flowers as many as 12 sweet scented and blue with dark blue spots on the segments. Column relatively short with the mid lobe covered with short irregular finger like projections and is deeply cleft along the top. Hair tufts white on very short side lobes. This plant also grows in clusters and therefore probably reproduces vegetatively. The seed seems to be mostly infertile.

A further hybrid between *T. nuda* and *T. canaliculata* has been recorded from the Hinks National Park on Eyre Peninsula but needs further investigation.

Thelymitra longifolia

In these notes no mention has been made of *T. longifolia* Forst. f. It is recorded by Rogers as having been found in S.A. but this author thinks that this plant does not occur in this state and has been confused with one of the *T. pauciflora* varieties. *T. pauciflora* may yet prove to be a variety of *T. longifolia*, a common plant of the north island of New Zealand.

In concluding this article a comment on the possible hybrids may encourage attempts to grow these plants from seed. Almost all of the hybrids that the author has seen have been far better flowered plants than the possible parents and appeared to be better suited to cultivation than the pure species, so there is the possibility of some very interesting plants being developed in this genus.

THE OBLIGING FAMILY MYRTACEAE

by Jean Turner

People known to be keen gardeners are frequently asked to recommend a tree or shrub that can be grown anywhere without much trouble. When faced with this problem I seldom look past the family Myrtaceae for it surely contains some of the most patient and long-suffering plants that I know, the leafy saints of the plant world, which are also among the most beautiful.

My own "victims" have to contend with a heavy clay soil, pH 8.3, and strong south-westerly winds which cause all but the strongest to show a tendency to lean in the opposite direction. They also have the added misfortune of being planted in a garden where the rule is—plant close together, some of them are sure to realise there is nowhere to grow but up and then there will be room for the others underneath. Though this policy helps the wind problem (in a few years nothing less than a hurricane will have a chance to get through) and temporarily satisfies the collecting urge, it leads to what, by all normal standards, is shocking overcrowding, so any plant that survives at all under these circumstances has got to be tough.

Here are the histories of a few that have proved their toughness.

Eucalyptus

Almost all species of Eucalyptus can be relied on to do well. However as these have been well presented for South Australian gardens in No. 49 issue, I shall hold my notes for a future issue.

Callistemon, though slower at first than they are on lighter soils, never give any trouble and do not seem to mind overcrowding. C. *speciosa,* C. *viridis,* C. *phoeniceus* and C. *citrinus* are all growing up through a thicket of miscellaneous items. 'Gawler Hybrid' is more fortunate as it has *Eucalyptus spathulata, Eremophila maculata* and a peach tree surrounding it on three sides, but a dog kennel on the fourth side!

Agonis flexuosa, half hidden under a large Prunus which was left as a shade tree until others were big enough to take over that role, still managed to reach the eaves of the house (yes, there is one but I don't know how much longer there will be room for it) quite quickly, and is now very pleased to see the sun.

Regelia velutina was a very shapely little tree about six feet high when it suddenly died for no apparent reason. I suppose there is a 'black sheep' in every family.

Melaleuca—If I should ever be so unfortunate as to be able to plant only one tree it would be a Eucalypt, and for one shrub I would definitely choose a Melaleuca though it would be very difficult to decide which one, as this genus contains some of the best all-purpose trees and shrubs to be found anywhere. *Melaleuca armillaris, M. micromera, M. ericifolia, M. incana, M. tamarisifolia, M. decussata,* and *M. gibbosa* have all proved very hardy and quick growing. *M. alternifolia, M. violacea, M. elliptica, M. densa, M. cordata, M. linariifolia, M. diosmifolia* and *M. glomerata* have been a little slower, mainly due to competition. *M. citrinus,* one of the best of the yellow flowered species, objected to the alkaline soil at first but responded to iron chelate and is now growing well. It is worth noting that a plant that is struggling to survive in its early stages in an alkaline soil may only need one or two applications of iron chelate or iron sulphate to keep it going until its root system is sufficiently extensive to supply all its needs, after which it can quite well look after itself.

Melaleuca nesophila was a victim of the wind, reclining gracefully on one elbow in the manner of Cleopatra. Examination showed that though half the roots were torn out of the ground the remainder seemed to be all right. As it was a bush about eight feet high at the time it was beyond me to attempt to stake it up, even if that would have been successful which I doubt, so I decided to leave 'Cleopatra' just as she was and got busy with the secateurs. What yesterday had been a lateral branch became the leading shoot and the rest of the bush was shaped accordingly. The top, which was now the side, being cut back to balance with the opposite side, the ends of the branches that were supporting the bush on the ground being sawn off as close as I could get to ground level. The result of the heavy cutting, as well as reducing transpiration until the damaged root system recovered, was an amazing amount of new growth so that in a few weeks it was again a well shaped, bushy shrub. As it is very dense right to the ground it is impossible to see, without parting the branches, that it is still held up by several of its original side branches. It is now about ten feet, covered with flowers every year, naturally buttressed by its branches.

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Study groups comprise readers who wish to grow species of a particular group of plants and observe results. They may reside in any part of Australia and contact each other through a leader usually by mail. No special qualifications are required for membership or even for the leader, just an enthusiasm for the cultivation of certain species. This method of organisation is particularly convenient for country members as well as town dwellers who do not, or cannot attend meetings. The leader arranges to keep all members abreast of the activities of others usually by some form of a newsletter and arranges interchange of seed, even plants.

Country members can be especially helpful, even if they do not wish to participate in the groups, by collecting seed from wildflowers in their area. This is urgently needed and we can arrange to have the plants properly identified for you. You can easily have this done yourself by sending a flowering specimen to the Director of the Botanic Garden in your State Capital City.

Some Study Groups and their leaders are:

Acacia: Mrs. J. B. Armitage, 10 Anembo Road, Terrey Hills, N.S.W. 2084.
Banksia: Jim Carney, 28 Linlithgow Street, Mitcham, Victoria. 3132.
Blandfordia: Don McNair, 42 Ingall Street, Mayfield, N.S.W. 2304.
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Eremophila: Mr. Ken Warnes, "Waldon", Owen, S.A. 5460.
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Hakea: Royce Raleigh, 23 Arlie Crescent, Montrose, Vic. 3765.
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WILDFLOWERS OF SOUTH AUSTRALIA

THE EMU BUSH



Plant photographed by Ron Hill at Koonamore in the N.E. corner of S.A.

EREMOPHILA STURTII

Eremophila sturtii is generally found in the under 15" rainfall regions on heavy, sandy clay soils. It is a shrub 6-8 ft. high with flowers which vary in colour from pale lilac through pinky lilac about ½" in diameter.

On page 296 another "Emu Bush", *Eremophila hillii* is shown and indicates the extent of flowering of these shrubs chiefly from the dry area plains. The article on page 294 will guide country people in very difficult garden situations, in the cultivation of these floriferous hardy plants.

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