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Photography by Frank Hurley

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❧ *How To Grow N.S.W. Christmas Bush* ❧

HOW TO GROW N.S.W. CHRISTMAS BUSH

By P. J. PARRY

Ceratopetalum gummiferum, the beautiful red Christmas Bush of N.S.W. is very well known in this State and much sought after for indoor decoration at Christmas time. The tree comes into white flower during October and gradually the bracts enlarge and change colour to a bright red towards the middle of December.

Although Christmas Bush grows naturally in sandy loam top soil with slightly heavier, well-drained sub-soil, it may be grown successfully in heavier soils, providing the water moves freely through the soil. Sticky clayey soil should be avoided for it is most unsuitable. However, even heavy clay can be opened up and drained from underneath. When buying trees buy only healthy green plants and remove from containers without disturbing soil or roots. Hard looking, stunted plants are usually a sign of being root bound or suffering from neglect. These plants are not a success when planted out into their permanent positions.

A natural plot of Christmas Bush was cleared of shrubs and trees over fifty (50) years ago by my brother. (These trees are still carrying five thousand (5000) bunches of bright red bloom each year.) Some years later when I took over this land, I observed in this natural plot that there were at least twelve (12) different variations, some pale and never turning bright red, whilst others carried only light crops of flowers. Although each tree received the same treatment they never varied from year to year. Many strains were worthless, so I decided to experiment by budding the useless trees with buds from a good seedling which I had raised and which had proved itself for years. The budding turned out to be a success, and now almost every tree carries a crop of bright red bloom. The buds were taken from the parent tree from November to January; most buds developed and made young shoots before autumn. The trees were carrying heavy crops of bloom two (2) years after budding.

Large areas are now grown in N.S.W. to meet the demand for the cut flower trade. The tree responds well to reasonable cutting and should be fertilized after the cutting. Blood and bone or fowl manure are perhaps the best fertilizers to use. If the bloom is not cut for indoor use the tree should be lightly pruned by the end of January. It will then make new growth to carry next season's crop of bloom.

At times the white flower is attacked by thrips which cause the bloom to fall before maturing. It is advisable to spray with a recommended spray to combat the thrips, when the buds commence to open.

Although Christmas Bush can be grown from cuttings I consider from seed is the best method. The bright red "flower" is actually the seed. This ripens towards the end of January when it should be picked and dried and sown as soon as possible during the warmer months of the year to assure good germination. Sow in a seed box or seed bed and lightly cover seeds, keep the top soil moist and seeds should germinate in from four (4) to six (6) weeks. When the seedlings are large enough they can be potted and grown on to a reasonable size before being planted in to their permanent positions; which should be sunny and well drained.

Plants should not be overwatered or allowed to dry out during the first twelve (12) months. When grown trees, the natural rainfall is usually enough, but if the weather is very dry when the tree is coming into bloom usually one good watering every two (2) weeks is sufficient.

Grow N.S.W. Christmas Bush From Seed

Submitted by THE FORESTRY COMMISSION OF N.S.W.

Seedlings of *Ceratopetalum gummiferum* (N.S.W. Christmas Bush), so widely cultivated and admired as a garden shrub, is a species capable of growth to 30 feet in height. The flowers have small petals, but these soon fall off. The calyx lobes enlarge and turn red, forming the attractive "flower". The Christmas Bush occurs naturally on sandstone country in the central and northern coastal sub-division. Its cardinal requirement is a well-drained soil.

Being prone as a seedling to attack by damping-off, provision first must be made to combat this menace. Damping-off is a fungous disease. When it affects the seedlings, the small plants may have appeared normally above the soil and reached the stage where a second set of leaves has formed. Then for no apparent reason, the seedling falls over and dies. The following recommendations are made:

1. Use a well-drained sandy soil, of river sand or decomposed sandstone. This should be a mixture of sand (2/3rds), and leaf-mould or well rotted humus, (1/3rd).

2. Sow in early spring or late autumn, when there are less extremes of temperature.

3. Keep seed boxes in a morning-sun position.

4. Water in the early morning or late evening, keeping the soil moist but not wet or saturated.

5. A sheet of glass placed over the box will assist in maintaining the required moist conditions for germination, but the glass should be so supported that there is an adequate air current. This can be accomplished by elevating the glass on blocks some two inches from the top of the seed box.

6. Sowing. The "flower" of the *Ceratopetalum* including the enlarged calyx lobes should be sown with only an approximate $\frac{1}{4}$ inch spacing. Best results are obtained if the stalk end of the flower is placed downward.

They should then be covered lightly with soil and pressed down firmly and lightly watered with a sprinkler. The percentage germination of this species is not very good, and the germination and appearance of the seedling may be from three weeks to three months.

7. They are best transplanted into tins when the first or second set of leaves has formed. Being of a deep rooting habit, care should be taken not to damage the root, and to see that the tip of the root points downward, and is not turned up, when transplanted. A small amount of blood and bone, mixed with the potting soil, helps to speed up the growth of *Ceratopetalum*. The potted plants, once established, should be gradually given increasing periods of exposure to sun and wind until they are hardened off. Potting of the seedlings should take place in early spring or mid autumn.

8. *Ceratopetalum* is often very satisfactorily sown in tins direct, by placing several seeds in the centre of the tin. After germination, select and keep the most vigorous of the seedlings, nipping the others off.

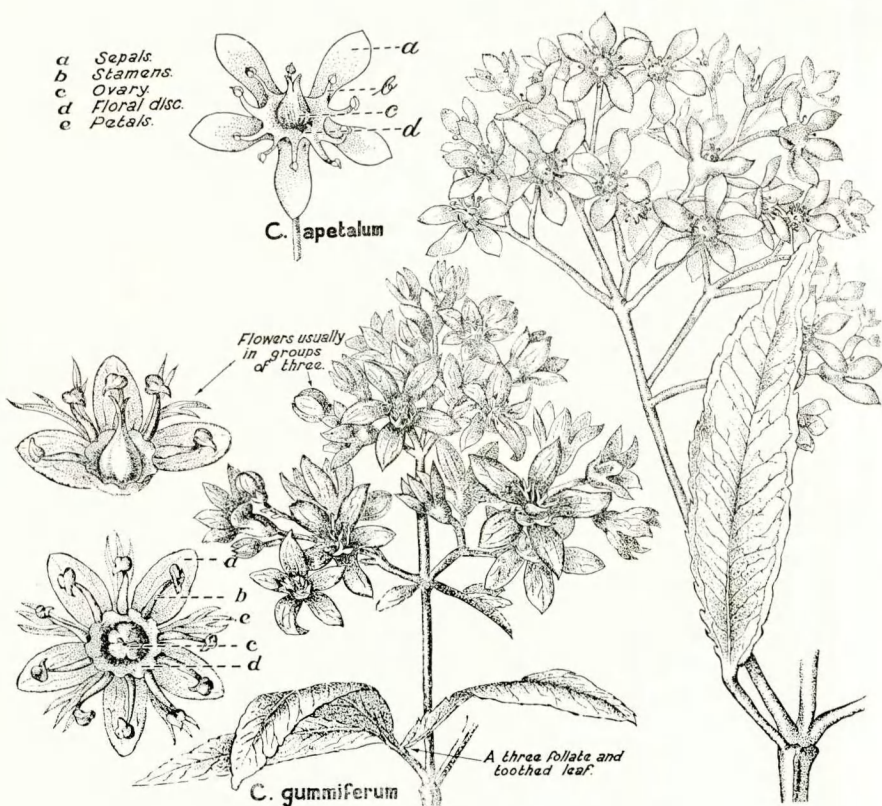
There are commercial sprays for the control of damping off but we recommend "Cheshunt Spray". Copper sulphate, CuSO_4 —2oz. and ammonium carbonate $(\text{NH}_4)_2\text{CO}_3$ —11oz. are ground together and left for 24 hours before use. Add one ounce of the mixture to two gallons of water. Enough should be sprayed on the plant that a flow occurs down the stem. Then spray with sufficient water to clean the leaves free of the "Cheshunt Spray".

THE GENUS CERATOPETALUM

By J. L. WILLIS, Director, Museum of Applied Arts and Sciences, Sydney

The genus *Ceratopetalum* (pronounced cer-a-to-pet-a-lum) is a member of the Cunoniaceae, (Cu-no-ni-a-ce-ae) a family widely distributed in the Southern Hemisphere, mostly in Oceania and Australasia, and containing some 250 different species. Of the 26 genera in the family, 13 occur in Australia, and in addition to *Ceratopetalum* include the important timber genera *Geissois* and *Ackama*, as well as such well-known members as *Callicoma*, *Weinmannia*, and *Schizomeria*. The structure of the flower is similar to that of the family Saxifragaceae, but the Cunoniaceae differ in the usually tree-like habit and the invariably opposite or whorled leaves.

The name *Ceratopetalum* is derived from two Greek words, *keras*, a horn, and *petalon*, a petal, referring to the stag's horn appearance of the jagged petals in *C. gummiferum*, the type species. *Ceratopetalum* is practically con-

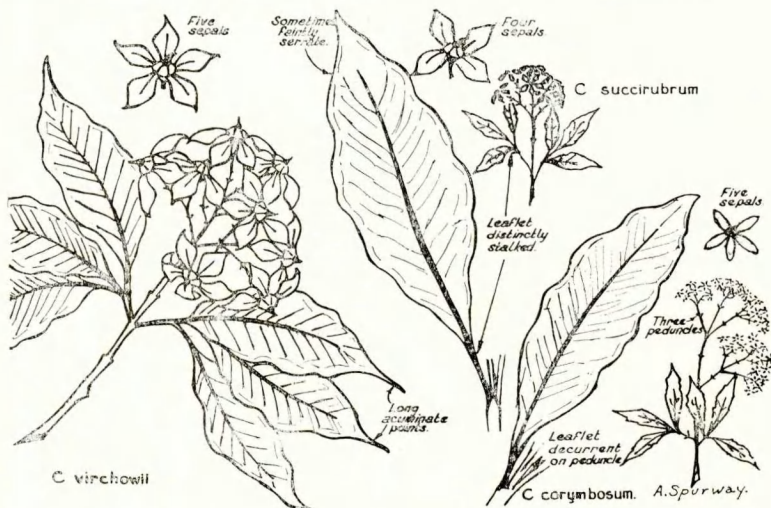


KEY TO THE SPECIES

- Leaflet usually solitary, lanceolate to elliptical, 2½ to 5 in. Flowers 4- to 5-merous 1. *C. apetalum*.
 Leaflets 3. Leaflets lanceolate, 1½-3 in., obtusely acuminate. Petals deeply cut into 3 to 5
 very narrow lobes, very caducous. Flowers 5-merous. 2. *C. gummiferum*
 Leaflets elliptical, 2-5 in., obtuse or obtusely acuminate. Flowers 4-merous. 3. *C. succirubrum*
 Leaflets broadly lanceolate to elliptical, 2-3 in., acutely acuminate, margin very slightly
 crenate. Flowers 5-merous 4. *C. virchowii*
 Leaflets narrowly lanceolate, or very narrowly obovate, 2-4 in., shortly acuminate, sessile.
 Flowers 5-merous 5. *C. corymbosum*

fined to the east coast of Australia, one species only (*C. succirubrum*) occurring in New Guinea. The genus is primarily tropical or sub-tropical, and consists of tall, shaft-like trees, sometimes reduced to shrubs. It is characterised by opposite, one to three foliate leaves toothed on the margins, four or five calyx segments, and twice that number of stamens. Petals are known only in one species (*C. gummiferum*). The fruit is small, hard and indehiscent and is surrounded by the wing-like, horizontally-spreading, enlarged calyx lobes.

Perhaps the best-known species is *C. gummiferum*, which is a feature of the more northerly coastal regions of New South Wales at Christmas time. The vernacular name "Christmas Bush" is given to this tree in New South Wales, and this sometimes causes confusion in other states and in New



Zealand where the same vernacular is used for entirely different plants. In Victoria, the "Christmas Bush" is *Prostanthera lasianthos*, and in Western Australia, *Nuytsia floribunda*. In Tasmania the term "Christmas Bush" is sometimes applied to *Bursaria spinosa*, whilst in New Zealand, "Christmas Bush" is *Metrosideros tomentosa*.

Ceratopetalum gummiferum, Sm. (Christmas Bush) (*C. gumm-if-er-um*), occurs usually as a medium-sized shrub, but sometimes reaches the dimensions of a tree. It occurs on the sandstone in the central and northern coast of New South Wales and the north of the southern coast. The shining leaves are opposite, three-foliate and toothed, whilst the flowers, which usually occur in groups of three, have small, white, jagged petals, which fall very early. The white calyx lobes, which are very small at first, enlarge as the flower matures, and become usually dark-red, although the depth of colour varies somewhat between individual specimens. It is the red colour of the calyx lobes, appearing at the Christmas period and forming a striking contrast to the shining leaves, which makes this shrub most prized for garden culture, particularly as some individuals often flower profusely. The wood exudes a dark-red kino when cut—hence the specific epithet *gummiferum* which means 'gum bearing'. The timber of the larger specimens is sometimes used locally for tool handles. In the first year of settlement at Port Jackson this species was given the name "Light Wood", a reference to

THE PRACTICAL HOME GARDENER—By T. R. N. Lothian—Director, Botanic Gardens, Adelaide.

As the majority of readers are home gardeners, I carefully searched for a book to recommend to them. I was surprised to find one so modern in treatment using all scientific developments of value, and yet covering all gardening subjects in such a clear, non-technical but accurate manner. The conditions met in any part of Australia are specifically dealt with including, I think for the first time, a competent treatment of country and dry areas as well as the Coastal regions. Australian native plants are presented on an equal footing with all other plants of horticultural value.

The *Practical Home Gardener* is meant for the practical home gardener interested in gardening anywhere in Australia. It has been compiled by a garden lover and worker of the old school who tried, and tried again until he achieved the best results, but using the latest methods as only a competent professional botanist would know how. It is obvious that the Adelaide Botanic Garden has been only one of a large range of testing grounds used to produce this amazing book.

It is usual in such a review as this to mention briefly the outstanding sections, or items of special interest. However, each of the 27 chapters so complete, concise and simply written that any reference to the excellent treatment of "Soils", "Plant Food and Fertilizers" or "Plant Propagation" may detract from the horticultural chapters on "Design in the Home Garden", "Annuals", "Rock Gardens", "Bulbous Plants", "House Plants", etc. It is sufficient that this is a large 355 page book of outstanding value.

Available from your bookseller or Lothian Publishing Co. Pty. Ltd., 1 Fleming Place, Melbourne C1.

Price 95/-, postage and packing 2/-.

ORCHIDS OF THE WEST—By Rica Erickson

For lovers of terrestrial orchids and particularly for residents in West Australia, this is an excellent book. The rear cover of this journal carries a copy of one of the beautiful 22 full-colour plates used, together with another 10 full-page finely detailed line sketches. The book is written for the beginner. The first chapter, "What Is An Orchid", is followed by chapters on the various classifications such as "Sun Orchids", "Donkey Orchids", "Enamel Orchids", etc., each presented in an easy to read, interesting style. In each chapter this is followed by a simple key to all West Australian species in that classification presented so that the interested beginner can easily identify the species.

This is a most outstanding book on West Australian terrestrial orchids, so well presented that it must always remain the classic reference book in this field for competent botanists and the interested bush Rambler for time immemorial.

Available from Paterson Brokensha Pty. Ltd., 65 Murray Street, Perth, West Australia.

Price 25/-plus 2/- postage.

the light weight and easy working properties of the timber. Later it was known as "Officer Plant", an allusion to the bright red tunics of the army officers of the young colony.

Ceratopetalum apetalum, D. Don (Coachwood, Scented Satinwood, Leather Jacket) (*C. a-pet-a-lum*) sometimes attains a height of 100 feet and a stem diameter of three feet and occurs from Bateman's Bay in the south coast of New South Wales, northward to the Macpherson Ranges in Queensland. It is a brush species, with a fragrant bark and wood said to be due to the substance coumarin. The flowers have no petals, and the calyx lobes enlarge and become red or reddish-purple in a similar fashion to *C. gummiferum*. It is one of the most important rain-forest timber species in New South Wales and yields an excellent, light strong timber, which is utilised in the manufacture of tool handles, furniture, flooring, and fruit cases. It is very readily worked and seasons without difficulty. A small-leaved variety, *C. apetalum* var. *microphyllum*, Bailey and White, described from the Macpherson Ranges, is now considered to be identical with the species.

Ceratopetalum virchowii, F. Muell (Dogwood) (*C. vir-chow-ii*) favours grey soils in rain forest or scrub, and is found mainly on the Atherton Tableland in northern Queensland.

Ceratopetalum succirubrum, C. T. White (Satin Sycamore, Blood-in-the-Bark) (*C. succ-i-ru-brum*) is a large tree attaining a height of up to 90 feet and prefers the richer soils in the heavy scrubs of the Atherton Tablelands. The vernacular "Blood-in-the-Bark" arises from the red exudation which follows wounding of the tree. The timber is tough and strong, although difficult to season, and is used locally as a general building timber, and as a furniture wood.

Ceratopetalum corymbosum, C. T. White (*C. cor-ym-bos-um*) is a rare species known only from a few specimens collected on Thornton Peak in North Queensland at an altitude of 4,500 feet.

The Genus *Eriostemon*, Sm.

SOUTH-EASTERN SPECIES — Part Two

By JEAN GALBRAITH

E. difformis, A. Cunn. (dif-form-is—irregular referring to leaves). Small-leaf Waxflower. Usually a low spreading undershrub of rocky sandy places, but occasionally up to three feet or more. Branches numerous, slender and graceful, with many small branchlets dotted with large "honey-drop" tubercles. Leaves crowded, usually pointing upward, very small and thick ($\frac{1}{8}$ " to $\frac{1}{2}$ " long) short-stalked, usually broadest toward the tip, with the edges curved back and made irregular (apparently crenate) by tubercles. The leaves are so small that the single line of tubercles on either side of the midrib is near, or on, the edge and noticeably affects the leaf-shape.



ERIOSTEMON DIFFORMIS

outside, not inside, and the filaments are very woolly and flattened, much narrowed toward the top, with the ripe anthers poised as in *E. trachyphyllus*. There are sometimes a few scattered very minute bracts on the short flower stalks. The fruitlets are small and slightly beaked. It is syn. with *E. gracilis*.

This is the daintiest of the waxflowers—in good forms very free-flowering and graceful—and most forms are small enough to be at home in a rock-garden. The species is very variable in abundance and size of flowers, and in leaf-shape and size, as well as height, but even so the foliage is quite distinctive, small, without hairs (or with only one or two) and with a double row of tubercles on the top of each leaf, but often appearing to be on the underside because of the recurved leaf-edges.

Mr. Cane reports a form with small oval leaves and (usually) green buds, and one with dark leaves and red flowers, both from Gladstone Creek area. A similar dark-leaved and red-flowered form was seen by Mr. T. E. George in the Victorian Grampians. Mr. Cane also remarks that all seedlings have narrow linear leaves until about eight months old or a bit more. However, this doesn't affect recognition of the species as recognition is not dependent on leaf-shape or size, but on the flowers (terminal, and not downy inside). This is the most widespread *Eriostemon* species. It grows in all mainland states, but not in Tasmania.

E. myoporoides, D. C. (my-o-por-oi-des, myoporum—like; here referring to leaves). Long-leaf Waxflower. Syn. *E. neriifolius*, Sieb.

A rounded well-branched shrub of from two to eight or nine feet high, but commonly about three feet. Branches, and sometimes leaves (especially underneath) tuberculate like soft sand paper. Leaves occasionally yellowish-green, but usually dark or bluish-green, long-ovate, lanceolate or oblanceolate, often bent upward on each side of the midrib. The midrib is the only noticeable vein and usually extends into a minute soft point.

Flowers grow mainly in the leaf axils, a few singly but most in umbels. Whether solitary or clustered they have always both primary and secondary stalks, and the junction of the two is marked by a few narrow pointed bracts, always minute, and sometimes so near the base that the primary stalk, a fraction of an inch long, is hard to see. The flowers are white or pinkish with red buds (except when grown in shade) normally with five petals, overlapping in the bud, but spreading into a star-like flower $\frac{3}{4}$ " to 1" across. The characteristic texture of the waxy flowers results from minute tubercles (visible under low magnification) on the backs of the petals.

The stamens, erect round the short green pistil, are alternately long and short (the alternate one about an anther-length shorter) with very flattened filaments, fringed with spreading hairs and narrowed where they bend outward slightly at the top. The two-lobed bright orange (later brown or yellow) anthers lie flat, lengthways, against the inner top of the filament, concealing it as the lobes open. They are versatile (attached by the centre only) but never seem to lift and balance on top of the filaments as do those of *E. trachyphyllus*. The whole distinctive appearance of the flower is given by the stamens, for the filaments, flattened, and bent outward at the top, their darker anthers tipped with minute white points, are like a delicate vase enclosing the green disc of the stigma set directly on top of five closely fitting carpels. Only when the anthers are pale and inconspicuous after shedding their pollen do the tops bend loosely outward, while the style lengthens bringing the mature stigma into a better position for cross-pollination. There are always, whether the flower has five petals or more, twice as many stamens as petals.

The carpels of a fertilised flower develop into cocci (fruitlets) each distinctly beaked at the top. Apart from its beaked cocci the most distinctive

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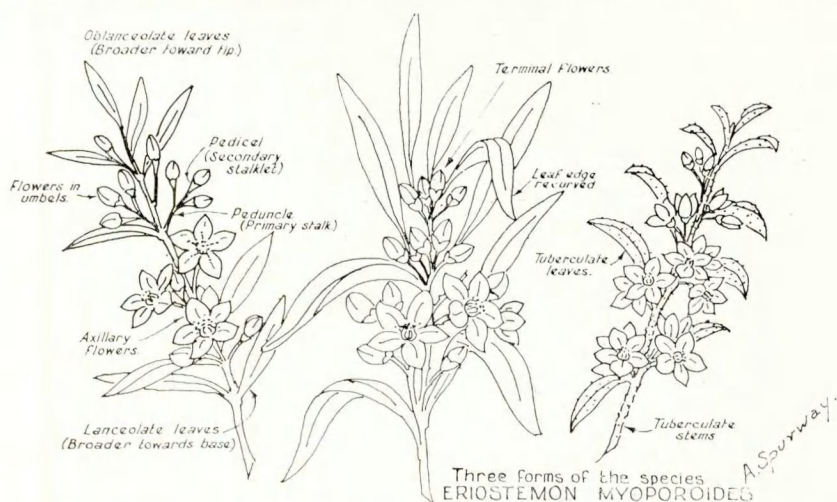
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(AT MILPERRA BRIDGE)



characters of long-leaf waxflower are the flowers with both primary and secondary stalks, and its tiny, narrow, non-velvety bracts,

There are more than a dozen forms of this species that are well worth growing, but not all are equally easy to propagate or cultivate. One of the easiest is the form that has been longest in cultivation, with up to four-inch narrow-lanceolate leaves, and an umbel of white flowers (with an occasional solitary flower) at the base of each leaf. Almost equally easy, and very attractive, is the dwarf shrubby form with bright pink buds (paler in shade). It has an umbel in each axil. A beautiful form from Gladstone Creek in Eastern Victoria has flowers forming long terminal panicles, as well as clustered in the leaf-axils. Fine short-leaved forms are known from eastern N.S.W. One of the most striking of all forms is "Clearview Appleblossom", with conspicuous red buds and very white semi-double flowers with the inner ring of petals standing erect round the stamens, and the outer one opening flat. It is, however, of rather sparse growth and harder to grow than other forms. The inner "petals" in this case are really petaloid stamens. In this it differs from other known double and semi-double waxflowers. Still another form has red buds and rather incurved pink petals, deepening almost to red at the tips.

E. myoporoides var. *minor* has leaves ovate, and many of them barely an inch long, while there is a luxuriant mountain form with large, thickly-clustered flowers, and leaves six inches long and an inch wide. In most forms the leaves are two to four inches long and under ½" wide.

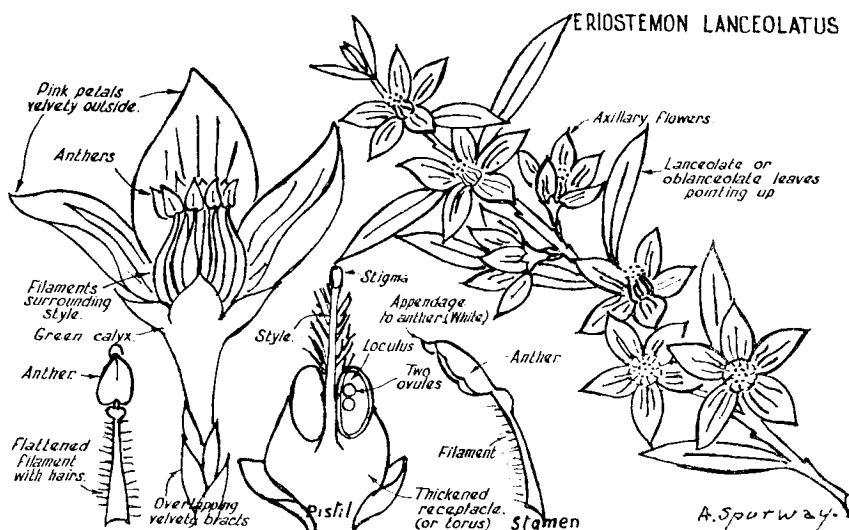
As lovers of native plants become more observant other forms will be found and propagated. The plants should never be dug up. Lifting of an unusual form may result in its loss forever. Instead take cuttings, put them at once into a polythene bag (one learns to carry these in the bush) close the top, and, unless very sure of your own ability as a propagator, share them with an experienced grower or growers. In rocky country some solid bits of rock piled round the base of a good form help you to find it again, yet are not too conspicuous, and they provide some protection to the root from fire. Where protected report your find to the responsible authority.

One grower at least is experimenting with hybridization of good forms, but so far most of our best forms have been propagated from wild plants.

One nursery-grown seedling "Swainsonii" is in commerce, and one grows in a private garden at Vectis, Victoria.

E. lanceolatus, Gaertn. F. (lan-ce-o-la-tus—lance-shaped) Pink Wax-flower. Syn. *E. salicifolius* sm.

A dwarf bush with branchlets inclined to point sharply upward. Leaves variable, but usually one to two inches long, linear, narrow oblanceolate, or oblong, and a rather bright green, minutely hairy when young, with a faint midrib and no other visible veins. Flowers usually larger than those of *E. myoporoides*, shell-pink to rose-pink or even red, growing singly in the leaf-axils, on stalks wholly or partly enclosed by broad velvety overlapping scale-like bracts. Both petals and sepals as well as bracts are velvety on the outside, with a clothing of minute silver hairs. The petals of no related species are velvety on the back. The stamens and pistil are substantially like those of *E. myoporoides* but the filaments are more hairy as a rule, and narrower at the top, with the white anther-tips bent back. The cocci are neither beaked nor rounded, but rather flat-topped. This is one of the finest of *eristemon* species, but one of the least adaptable in cultivation.



There are two multi-petalled forms (one in cultivation) known from N.S.W. and from the same state (to which *E. lanceolatus* is endemic) come beautiful white and mauve flowered forms.

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A WORD ABOUT ERIOSTEMON LANCEOLATUS

By BOB DONEY

In a word: PROBLEM! *Eriostemon lanceolatus* is one of two plants which particularly defeat me and, in terms of complete success (high percentage and understanding) I shrewdly consider that it defeats others. (Protagonists please queue from the right). This plant can be grown from seed, cutting, or transplant with reasonable ease if grown in a soil taken from normal habitat, but attempts to "civilise" it—i.e., analyse and understand its needs and supply them in any soil—have met with varied results and certainly are dependent on luck, for the factors of success are unknown. The only positive finding I have to offer is that *E. lanceolatus* must have a specific before it will succeed. It might be biological or it might be chemical.

Some years ago I conducted experiments in the growing of natives in a "base" complete soil. A soil of no particular type, but having good structure ensuring drainage, pH of 5.5 to 5.8 and a balanced food ration added. Of roughly 800 species of at least 80 diverse genera only two plants were not greatly benefitted. *E. lanceolatus* was one of them. Check plants of *E. lanceolatus* gave results ranging from prodigious growth (one plant) to quick failure (one plant) and others stood still for 6-12 months. Some later went ahead and others died. I don't know the answer for I haven't followed on from there, but some day I shall.

Propagation from cuttings, if successful, is best because of the great colour variation seen in seedlings. Soft tip cuttings two inches (?) long I consider the best material. I dare not state a "best" time because I don't know. My first propagation of *E. lanceolatus* (using such wood) produced astounding results. Better than 90% strike of 250 cuttings of which I raised only a few to the stature of grown plants. Though careful record was kept I have never since exceeded 20%. This I regard as failure.

Next most successful is a transplant as small as possible—two or three inches—to a "natural" soil preferably in a four-gallon drum with ample drainage and mulched with *Casuarina* needles. This plant seems to tolerate—or need?—plenty of autumn and winter water, but summer water should be kept to a minimum.

SEED: I have tried several treatments with little or no success. (One man has tried at least 30 different treatments using many hundreds of seeds with no result other than failure. He is not a fool, nor incompetent, so your guess is as good as mine. On the other hand, some claims of great success are made?)

Forgive my pessimism, but *E. lanceolatus* is a problem to me and others, but you can be lucky, so please try and we may yet learn the secret.



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The Genus *Prostanthera* . . . part 3

By G. W. ALTHOFER

My introduction to the genus *Prostanthera* came away back in the 1920's. One day in spring—I have forgotten the exact year—when climbing up the cliff faces of Barren Jack, a high eminence of the Dickerton Ranges near Wuuluman, N.S.W., I came on an exquisite shrub ensconced in the rock clefts high on the southern cliffs. At first only a few plants were seen, lovely in the last rays of the setting sun. Here the mountain is cleft in twain by an erstwhile tiny rill which, through the centuries, has torn a gap in the southern cliff face of Barren Jack. In the summer storm time this short, precipitous stream bed becomes a raging torrent of water and crashing boulders, leaping down the mountainside to join the placid Macquarie. Across the way Burrill Creek wends between green hills from up Nindethana way. This, then, was the setting for my introduction of the genus *Prostanthera*. The flowers borne in riotous profusion were a lovely sight, their pristine whiteness enhanced rather than marred by the fading light.

PROSTANTHERA NIVEA, for such this was, a slender shrub of a height of six to seven feet, extended far up the cliff face in every nook and cranny. Where the mountain was cleft by the southern-flowing streamlet, from the cliff base to the stream bed, the mint bushes billowed in snowy elegance.

Not so many years later when exploring a gorge on Mt. Wellesley, only two miles from the town of Wellington, I again found this species growing in profusion. Again it hugged the southern slopes and climbed the cliff faces with its boon companions of the Barren Jack area—Blue Bell (*Stypanandra glauca*), Wallaby Bush (*Beyeria viscosa*) and again its companion numbered amongst their range the Weeping Boree (*Acacia vestita*) and the Spear Wood of the Aborigines (*Acacia doratoxylon*). The great droughts that ravage this area periodically kill the Snowy Mint Bush out almost completely, but such is their regenerative power that after a drought is past countless thousands of seedlings of *Prostanthera nivea* are pushing their way sturdily through the soil. One year may be a poor year for flowers of this species, which was represented only by a few old warriors with their feet deep in the cracks of the cliffs where they are able to tap hidden moisture reserves. But the next year the Snowy Mint Bush will make amends and the whole southern expanse of Mt. Wellesley and Barren Jack will be deep in the flower drifts which distance likens to snow.

Since the lonely days prior to my discovery of the Snowy Mint Bush here on my own doorstep so to speak, there have been many peregrinations to the shrine of Our Lady of the Snow—*Prostanthera nivea*. Came the day when I went not alone and my steps were lightened by the company of Audrey, my wife, friend and companion of the years of my Mint Bush Argosy. Each year as spring wended her way over hill and dale Audrey and I climbed those sheer hill cliffs and ever the magnet that drew us inexorably upward was the patch high on the mountain's breast—the snow of *P. nivea*. Years later when Peter, my brother, was travelling between Cudal and Eugowra he found this exquisite shrub growing on the precipitous slopes on the north-west side of the Eugowra Hills, but instead of white flowers these were a lovely shade of blue—or rather various shades, for the flowers ranged from the palest blue to the deepest sky blue. Later on still, Mr. W.



Photo by N. Chaffer

PROSTANTHERA PHYLICIFOLIA

Bassett reported the finding of this blue form some miles from the Eugowra Hills on the western slopes of Namur Mt. between Canowindra and Manildra.

PROSTANTHERA PHYLICIFOLIA. A dainty little species of the eastern mountain fringe is *Prostanthera phyllicifolia*, F. Muell. A lover of the rock strewn and cliffed hillsides, this species has often been confused in the past with *Prostanthera linearis*, R. Br. The shorter leaves and generally larger flowers with lower growing sturdy appearance, readily distinguishes this species from *P. linearis*. The rather thick, almost sessile leaves and the wide-gaped flowers are admirably shown in the colour photograph. Generally speaking *P. linearis* keeps to the lower altitudes on the eastern fall of the mountains whilst *P. phyllicifolia* is at home in the mountain areas above 2,000 feet. My only experience with this latter species has been in the Southern Alps in the vicinity of Tolbar and the Kosciusko area in general.

A closely related undescribed species (or perhaps a variety) is known only from Mt. Canobolas, Orange, N.S.W. This form has handsome violet striations within the corolla instead of the usual violet suffusion typical of the normal *P. phyllicifolia*. The usual height of the species is three to four feet and that of the Canobolas form two feet but much wider in spread.

PROSTANTHERA LINEARIS, a vision of filmy loveliness in the coastal gullies is a tall sometimes pendulous shrub, much taller than *P. phyllicifolia*. A lover of coolness and damp this species has white to pale blue flowers which in the half light of the encompassing bushland are very beautiful. Forms with pale mauve to violet flowers are also a feature of the central coast area of N.S.W.

EDITOR'S NOTE—Many readers have commented on their pleasure with their purple mint bush *P. ovalifolia* and this article presents three readily grown white mint bushes. The best situations are soils with good drainage and plenty of leaf mould. D. Miller of Shepparton, Victoria, advises: "Mint bushes do very well in this region, a wide flat valley of the Goulburn River with heavy chocolate soils. My best bush receives sun all day, is close to a red river gum and has better drainage and more leaf mould than others". These white mint bushes will thrive under similar conditions, and will also do well with poorer light soils and infrequent or natural watering, but as with all mint bushes they should be pruned after flowering. Tip pruning, the removal of the two new leaves on the end of each branch, throughout the life of the plant will give a very well-shaped compact bush.



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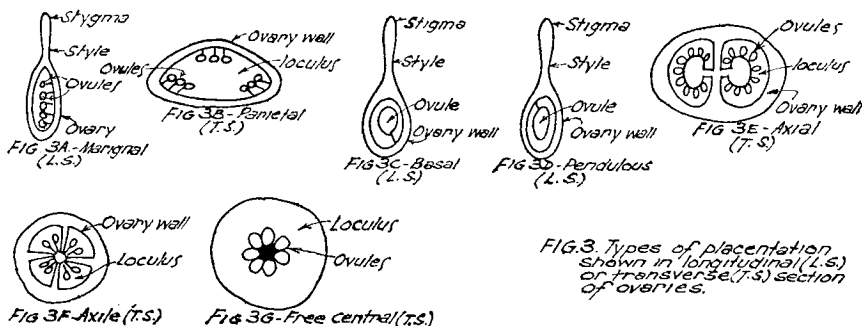
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THE FLOWER (PART 4) By HELEN PURNELL

In articles 1 and 2 of this series, the floral parts known as the perianth and androecium have been described. In article 3, a description of the gynoecium was commenced and will now be continued with some discussion of placentation, i.e., the arrangement of the ovules within the ovary.

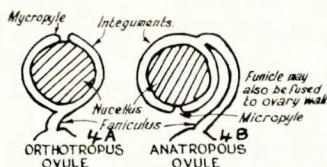
PLACENTATION (the gynoecium continued)

The arrangement of the ovules within the ovary is known as the placentation. The region in which the ovules are attached to the ovary is known as the placenta. In the apocarpous unilocular gynoecium of the family Leguminosae, the ovules are attached along one side of the ovary and the placentation is said to be marginal. (Fig. 3A). In *Hybanthus* (violaceae) which has a unilocular syncarpous gynoecium, the ovules are attached in three groups to the outer wall of the ovary and the placentation is known as parietal. (Fig. 3B). In unilocular ovaries containing only one or few ovules, the placenta may be basal, e.g., family Compositae, *Aster*, *Olearia*, etc., (Fig. 3C) or the placenta may be near or at the top of the ovary so that the ovules hang down. Such ovules, which are said to be pendulous are found in *Pimelea*, *Daphne*, *Petrophile*, etc. (Fig. 3D). The placentation is known as axile when the ovules are attached to the septum dividing the ovary into two or more loculi as in, e.g., *Solanum nigrum* (blackberry nightshade) (Fig. 3E). or when the ovules are attached to the central axis of a multicellular ovary as in *Eucalyptus* (Fig. 3F). In some flowers the ovules are attached to a central column in a unilocular ovary. Such placentation is called free central and is found in the members of the family Caryophyllaceae (*Stellaria* (chickweed) carnations, etc.) (Fig. 3G).

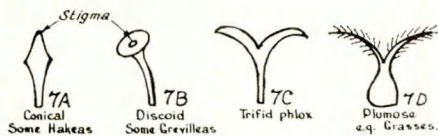


The mature ovule of all flowering plants is fairly uniform in structure. Most of the ovule is occupied by a dense tissue called the nucellus and this is surrounded by one to three different layers of cells called the integuments. The integuments entirely cover the nucellus except at the apex where a tiny pore, the micropyle, remains. The stalk or funiculus of the ovule is attached at the base. There are two common positions for the ovule. If the ovule is straight, with the stalk, base and micropyle in line, the ovule is said to be orthotropous (Fig. 4A). Sometimes the ovule curves over during development so that the micropylar end comes to lie beside the funiculus and such an ovule is known as anatropous (Fig. 4B). Positions intermediate between these described are known in other plants.

An important feature of flower construction is the point of attachment to

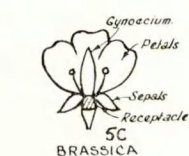
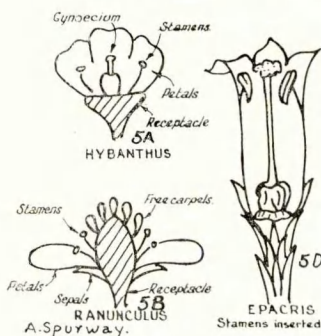


Common positions of ovule in the ovary.



Some common types of Styles.

the receptacle of the ovary relative to the other whorls. When the ovary is situated above the points of attachment of the perianth and androecium, the flower is said to be hypogynous and the ovary superior. This means that the receptacle must be flat, e.g., *Hybanthus* Fig. 5A, or conical, e.g., *Ranunculus*



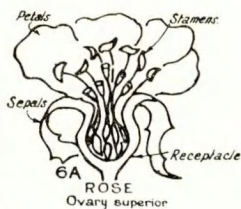
HYPOGYNOUS FLOWERS WITH OVARY SUPERIOR

(Buttercup) Fig. 5B, or dome-shaped, e.g., *Brassica* (Wild Tulip), 5C. In flowers such as *Epacris* (heath) Fig. 5D, in which the stamens are epipetalous and inserted above the gynoecium, the flower is still regarded as hypogynous.

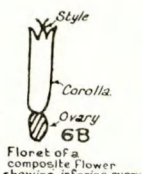
Sometimes the receptacle may be saucer or cup-shaped, so that the parts of the perianth and androecium are inserted above the ovary (Fig. 6A). Such flowers known as perigynous and the ovary is still regarded as superior because it occupies the apex of the receptacle. The sides of the cup-shaped receptacle are often called the thalamus tube. These features can be seen in the garden rose.

If the receptacle is completely closed over the top of the ovary, the flower is said to be perigynous and the ovary inferior. In these cases the wall of the ovary is usually fused with the tissue of the receptacle. Members of the family Compositae (e.g., *Olearia*, *Helichrysum*, *Aster*).

In some perigynous flowers there is some fusion of the ovary wall above the base with the sides of the receptacle. In such flowers the ovary is considered to be semi-inferior, e.g., some members of the family *Rhamnaceae* such as *Cryptandra* (Fig. 6C).



PERIGYNOUS



FLOWERS



The form of styles and stigmas is occasionally useful in classification. Frequently the style is divided and the number of branches may be an indication of the number of carpels which compose the gynoecium. E.G., the style of *Phlox* is three-lobed at the tip (trifid) and there are three carpels in the gynoecium. However, the flower of *Eucalyptus* which has two to six united carpels has only one style and stigma. Some common type of styles are illustrated in Fig. 7.

Try *Verticordia* From Seed

By M. L. ROBERTS

My experience with the propagation of *Verticordia* seed in Sydney mainly corroborates the excellent advice given by Mr. W. N. B. Quick, and will, I hope, spur on others to try themselves.

1. Seed box should be about $4\frac{1}{2}$ " deep, well crocked to a depth of one inch at the bottom and then filled to within $\frac{1}{2}$ " at the top with a sandy gritty mixture containing a small quantity of peat moss. Leave the soil loose at the top.

2. Fresh seed is important although it may not germinate until 18 months old. Scatter the seed on top and press down with palm of hand sufficiently to prevent seed blowing away.

3. Keep damp in usual way by light watering often, with the seed box in the open—not under glass. (Shade NOT needed as sown in winter.) Make certain seed box is exposed to light rain and covered in heavy showers. This accelerates germination. I have had no plants at all, then a shower of rain brings them up in no time.

4. Transplant into a sandy mixture containing enough peat moss to prevent drying out. The mixture should also include a small amount of fine gravel to provide aeration. NEVER put potted plants under glass. I lost over a hundred of one batch doing this.

5. Here is the interesting thing. Sow in winter, late May or June for preference. I have found, too, that often some seed will not come up the first winter but will show through the following June or July. No treatment of seed is necessary and it is vital to sow on top of the seed box. My experience has been that burning prior to sowing does more harm than good.

6. It is important not to plant seedlings in the garden until they have formed considerable root growth—say four to five inches high. My own experience with these plants under garden conditions is too limited to be worth very much. It is easy enough to propagate the genus but to cultivate seems more difficult. For what its worth I would suggest the following:

(a) Select a healthy bushy seedling—a spindly plant, within my experience, will stand still and then die.

(b) Protection from full force of the sun is essential.

(c) Soil should not be too heavy, but very sandy soil is also undesirable because of risk of surface roots being burnt. Good drainage is important.

(d) Young plants should be kept damp in hot weather but avoid over-watering. When well-established, except during abnormal dry spells, normal rainfall (in Sydney) is quite adequate.

(e) Add a little beach sand around plant once a year. There is no certainty to my knowledge that this actually does any good, but theoretically there is something to be said for it—at least it does no harm to the few species I have tried.

SOME INTERESTING CORRESPONDENCE RECEIVED ON VERTICORDIA

From W. A. Strutt, National Park, West Australia:

"The article by Mr. W. N. B. Quick, with its expert classification of the composition of W.A.'s 'sandplain' soils, in the Genus *Verticordia*, should encourage Eastern States enthusiasts to increased efforts to establish plots of suitable species. *Verticordias* are not found in the deep free sand of Perth's Metropolitan areas. To get some idea of suitable soils, Victorians need only take a tour round Officer, Upper Pakenham and Nar-Nar-Goon. In N.S.W. the Hornsby District is similar. Queenslanders will find something similar round Darra and Ipswich. Even the light surfacing of grey sand is not essential. The yellow clay, if shot with nodular laterite (gravel) provides a perfect bed. A colourful combination of species found in association

on such soils in W.A. would be *V. picta* and/or *V. insignis* (pink). *V. chrysantha* and/or *V. acerosa* (yellow). *V. plumosa* (mauve) (deep purple) *Cal. sapphina* (light purple)."

Mr. W. N. B. Quick in his advisory capacity to me on *Verticordia*:

"Mr. Strutt's report is excellent, and the soil comparisons are a valuable point, which could be emphasised. Personally I now rather lean to the idea that the soil type, as long as it is on the right side of neutral, is far less important than the soil structure and drainage with special attention being given to 'fresh air'. Ipswich in Qld. certainly has suitable soils but they get frosts there!"

Mr. W. A. Strutt has replied:

"Mr. Quick's reference to 'fresh air' is important. Stagnant air conditions would be a consistently high humidity over prolonged periods. His article mentions the vale of trees in absorbing soil moisture and creating air circulation below and between the trees. Concerning frosts, I can name several districts in West Australia's wheat belt subject to severe frosts during each dry period of our winter yet *Verticordia* species *chrysantha*, *picta*, *huegelii* and *insignis* thrive and are a feature of the treeless sand plains. In our Hills District the condensing air on frosty nights creeps in from the inland east, low areas exposed to the east recording lower temperatures while a timber belt will shelter north to south to west aspects. In eastern Australia the circulation of air is reversed so easterly to south east aspects would be favoured. I was particularly impressed with the article by Mr. R. Doney. It was very competently and accurately presented."

CORRECTION to "Verticordia Can Be Tamed", in Sept. issue. Item C should have recommended N to S.E. aspects.

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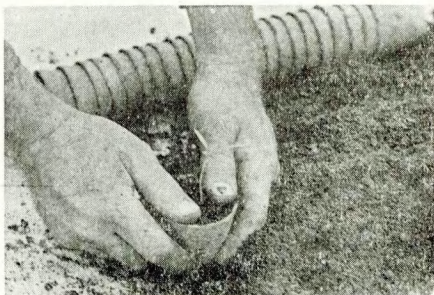
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THE TREATMENT OF CUTTINGS

A METHOD FOR THE SANITISATION OF PLANT CUTTINGS . . . H. BOYD

A plant cutting is portion of a living plant usually comprising a length of stem with some leaves attached at the top end, prepared for vegetative propagation. It is, when first prepared, living tissue, which, if protected from its natural enemies, will under favourable conditions become a living plant, with all the characteristics of the parent. Many species of plants will yield cuttings which, after simple preparation, require little more than a suitable potting media, and favourable conditions to produce a reasonable percentage of strikes. However, many plants are difficult to strike requiring a longer time and more exacting conditions and often these plants are prone to infestation by natural enemies. The adoption of simple procedures for the sterilization or sanitisation of cuttings will yield better results. The methods used are based on the removal of minute animal life from the cuttings as most of these beasts have symbiotic cellulose digesting organisms living in their gut. These are passed out to infect the cutting bed. The plant tissue may then be digested by fungi and bacterium or other micro-organisms before the cutting has developed enough vigour to survive these attacks. For cuttings this is associated with rotting out of the cutting where it is in intimate contact with the medium such as sand.

Sanitisation can be affected simply by washing the cuttings in an anti-septic solution. The writer has used calcium hypochlorite (a cheap bleaching powder available from a chemist, keep it moisture free in an air-tight container), an ounce, or four level teaspoonsful, to one pint of water. Allow the residue to settle. Add three drops of a household detergent (used here as a wetting agent). The clear chlorinated solution is then ready for immediate use before the chlorine gas escapes. Immerse the cuttings for thirty minutes then wash in sterile boiled water and plant in heat sanitised cutting sand. A commercial preparation "Clorize" in a concentration of one in twenty solution, has also given satisfactory results.

STORAGE AND TRANSPORT OF CUTTINGS:

Such sanitisation procedures assist the use of vegetative propagation methods in many other ways. Cuttings may be transported or sent by post with very little deterioration. If light does not fall on leaf material, some of the leaves may abscise (fall off) but the wood remains viable. As an experiment I have kept plant material for a month in a tin which was soldered to become completely air- and light-tight and then propagated it.

For storage or transport wash the cuttings in boiled sterile water to remove the chemicals after sanitising them and place them in a clear plastic bag, leaving just a little water clinging to the specimens. Fold the plastic bag so as to be reasonably air-tight and dispatch in a carton so that cuttings will not become crushed. If to be kept in this manner for more than a few days it would be as well to further treat the cuttings for fungi after sanitising them as described. Immerse them for thirty minutes in a solution of Condyl's crystals (potassium permanganate, a very good fungicide), one teaspoonful to a gallon of boiled water. Treat the plastic bag also and if possible use tongs to transfer the cuttings from the cleaning boiled water to the bag. This procedure, no doubt, seems a lot of trouble but if you wish to trouble with transporting cuttings, possibly between states, it is worthwhile.

This method is also suitable for carrying bud wood over until the next season. Thicker wood such as Rose and Apple Scions should be closed with grafting wax such as "Colgraft" a couple of days before treatment.

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FROM THE EDITOR: Our journal has now been in production for one year. I am sure that readers will forgive me for again featuring the writers who pioneered the first publication. The fine support and articles from Mr. J. L. Willis is particularly appreciated and readers can look forward to further excellent articles. He is again given fine support by Mr. P. J. Parry. Mr. H. Boyd continues to share his invaluable experience and I urge readers to try his methods and report results. We are all greatly indebted to Miss Helen Purnell for her botany articles. This series is not an elementary botany lesson, but is leading the reader into articles more closely associated with the cultivation and understanding of plants. The apparent elementary nature of these articles is due entirely to the skill of the writer, the information not being normally available in this clear up-to-date form in any other publication. This issue also includes articles from our most indefatigable supporters, Miss Jean Galbraith and Mr. G. W. Althofer.

Members of the Publishing Section have all done more than their share but special mention must be made of Mrs. H. Spurway who illustrates the articles so artistically with her beautiful sketches. They are prepared from the roughest material, usually flowering specimens that partly survive transport to her in Brisbane, a really gifted talent.

This issue is 24 pages printed in 4,000 copies. This is partly due to the fine work by the Sales Representatives in S.A., Mrs. R. L. Birch and in N.S.W., Mr. P. D. Leak, but also to the marvellous support from over 100 other societies from all over Australia. These include Preservation Societies, Horticultural Societies, Local Garden Clubs, Orchid Societies and many others who appreciate the service we can offer them.

Readers can assist this publication by sending in comments on the journal and their experiences with the species mentioned. Colour slides of native plants are urgently needed if you like full use of full colour plates. These will be returned promptly in good order. For example, I need colour slides of the "Christmas Bush" in other States, such as *Prostanthera lasiantha* in Victoria, so get those cameras busy. Articles from other States, particularly South and West Australia are now coming to hand for 1961 publications.

The policy of this society and the journal is **PRESERVATION BY PROPAGATION**. Australian plants could make exceptional garden subjects but we have so much to learn. Members are invited to join in the work of special study sections which are formed to examine growing habits and needs, and to develop better blooms of certain species. Some Study Sections have already been formed to examine *Telopea* (Waratahs), *Acacia* (Wattles) *Prostanthera*, *Verticordia*, *Orchidaceae*, *Eriostemon*, *Epacris*, *Melaleuca* and *Eremophylla* and you are invited to join. No experience is necessary only the desire to grow plants in your garden and to report results. In some cases, plants or seed of the species chosen are available for postage cost only. For instance members with large areas, particularly in the country, could receive a large range of *Acacia* species (wattles) without cost, to form a small arboretum of their own. Advice is then given on growth requirements and on how to develop better plants.

THESE PLANTS ARE WANTED

Eucalyptus nicholi—Seed of this fine leaved tree is needed.

Eriostemon affinis, *E. brevifolius*, *E. virgatus*, *E. trachyphyllus*—Plants or cuttings.

This section is available to all readers who are seeking a special plant for a fee of 5/- per line. This service is available gratis to the special Study Sections. All replies c/o Editor.

THE GENUS *EPIBLEMA*

By RICA ERICKSON

This Western Australian genus of the orchid family is limited to a single species *Epiblema grandiflorum*, a handsome plant commonly known by the delightful name of "Babe in a Cradle".

It grows about 18 inches tall and has a single linear leaf. In habit it resembles very closely the well-known *Thelymitra ixioides*. As in that genus the sepals and petals are all nearly equal and spreading. The flowers are comparatively large and exceedingly beautiful, an exquisite blue with darker veins and dottings that the artist despairs of matching. The column is erect and short, with broad petal-like wings hooded above it. The labellum is clawed, and here lies the difference between the genera *Thelymitra* and *Epiblema*, for the petal-like labellum of the former is plain while in the latter it is adorned at the clawed base with a fleshy pair of spotted appendages, as well as a tuft of uptilted hairs.

It is this difference that inspires children (and others) to see a child in a cradle in the heart of the flower. The column wings are the cradle's hood and the hollowed petal labellum is the bed. The column is the upper part of the child's body with a cap on its head (the anthers). The wildly kicking legs and blanket are the tuft and the appendages.

Native orchids are protected plants in Western Australia which means that they may be picked only on private property and with the consent of the owner. I have not heard of anyone trying to grow *E. grandiflora* in a pot and I doubt if it can be done with continued success as our terrestrial orchids do not transplant readily and usually survive for only a season or two. The problem of growing them from seed has not been solved to my knowledge. The late O. H. Sargent attempted for many years to raise native orchids from seed. He had a grant from the C.S.I.R.O. to intensify his researches into the problem without success. Closer settlement and drainage schemes are the main threat to *Epiblema grandiflorum*. While there remain untouched swamplands along the south coast of Western Australia it is likely that "Babe in a Cradle" will survive to delight the eyes of seekers for many years to come.

"Babe in a Cradle" may be found in the swamps of the coastal regions of south-western Australia, having been collected in many localities from Cape le Grand near Esperance and around to the vicinity of Perth. It was formerly known in a swampy area of one of Perth's suburbs which is now covered with homes and gardens. These swamplands usually dry out in the summer months and it is then that the flowers appear, rising from a thicket of undergrowth or clump of reeds.

"Babe-in-a-Cradle" is not uncommon in its habitat especially along the south coast. But it is not often seen as the prospect of searching for it through dense mats of reeds or the prickly undergrowth of a possibly snake infested swamp does not appeal to many.

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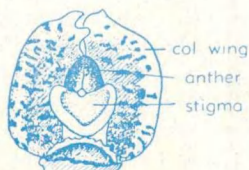
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N.Q.

A WEST AUSTRALIAN TERRESTRIAL ORCHID



1 Side view of column and labellum



2 Front view of column showing lateral appendages of column extended above anthers. Note the viscid disc present on upper edge of stigma



3 Rear view of column



4 Upper view of labellum showing appendages at base



Side view of appendages



6 Pollinia and viscid disc withdrawn on a needle.

Block from *Orchids of the West* by Rica Erickson

Courtesy of Paterson Brokensha Pty. Ltd.

EPIBLEMA GRANDIFLORUM

Commonly known as "Babe in a Cradle" it closely resembles *Thelymitra ixioides*