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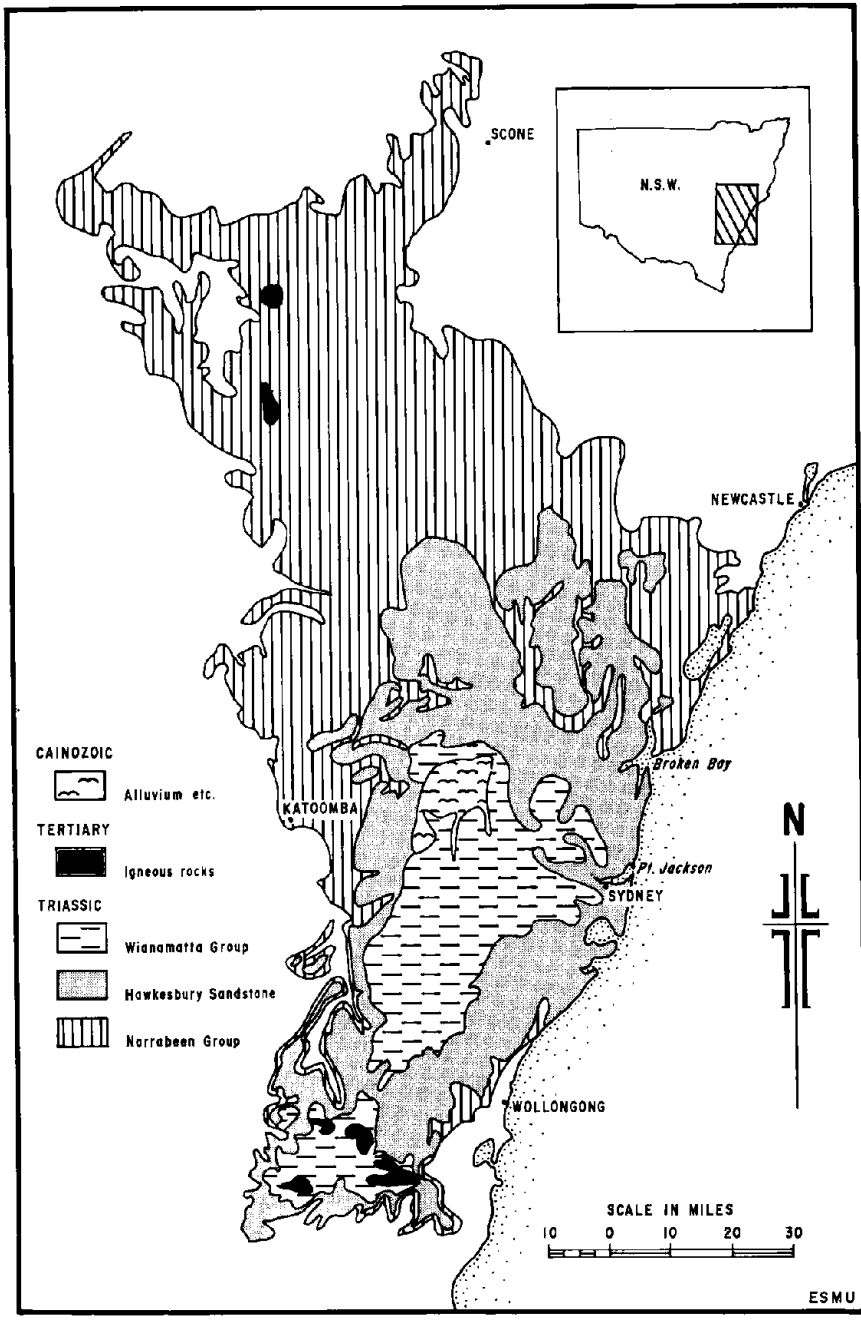
Photography by Frank Hurley *Blocks by courtesy of John Sands Pty. Ltd.*

THE HONEY FLOWER—*Lambertia formosa*

SYDNEY'S WILDFLOWERS



MAP OF THE TRIASSIC ROCK SEQUENCE OF THE SYDNEY BASIN

I am indebted to the School of Earth Sciences, Macquarie University, for preparing the map of the Triassic rock sequence of the Sydney Basin and to Betty Maloney for the illustrations of a number of the species described.—A. Blombery.

HAWKESBURY SANDSTONE FLORA

by A. M. Blombery

The Hawkesbury Sandstone, which is part of the Triassic rock sequence of the Sydney Basin, produces some of the most colourful flora on the eastern coast of New South Wales. There are a large number of plant species admirably suited to cultivation; a number of these species extend beyond the Hawkesbury Sandstone and, in some cases, to other states of Australia.

The Triassic rocks of the basin extend from approximately the Shoalhaven River, some 100 miles south of Sydney, to near the Hunter River, 100 miles north of Sydney and 100 miles westward to Lithgow. The Triassic sequence consists of 3 main rock groups: the Narrabeen Group, which is the oldest, the Hawkesbury Sandstone, which, when present, overlies the Narrabeen sandstones and shales and underlies the shales of the Wianamatta Group. The approximate limits of the three groups are shown in the attached sketch, Fig. 1.

(1) The Narrabeen Group consists chiefly of sandstone interbedded with clays, shales and conglomerates. The sandstone closely resembles the Hawkesbury Sondstone from which it is sometimes almost indistinguishable.
(2) The Hawkesbury Sandstone consists chiefly of quortz grains cemented by clay or limonite (iron hydroxide).
(3) The Wianamatta Group is composed chiefly of shale and clay with subsiduary sandstone.

The Wianamatta Group is found chiefly west and south-west of Sydney; and where it has been eroded away there are outcrops of Hawkesbury Sandstone. The Hawkesbury Sandstone is common in Sydney and its environs, where there ore extensive areas exposed, particularly to the northern, north-west and southern parts. The northern limits of this sandstone is some 80 miles north of Sydney to near Lake Macquarie, 60 miles west to the Blue Mountains and 100 miles south to the Shoalhaven River. The sandstone which is of a yellowish colour weathers to most attractive colours of reds and browns, due to the presence of iron; numerous lichens and mosses which grow on these rocks add to the colourful appearance of the sandstone.

Growing on these Triassic rocks is a wide range of plants, varying from large forest trees and shrubs on the heavy Wianamatta clays, graduating to smaller species on the Narrabeen group, to lower-growing shrubs and often stunted trees of the Hawkesbury Sandstone. It is amongst these small shrubs where the most colourful species occur.

The Hawkesbury River with its bays and tributaries dissects the sandstone into numerous gullies and ridges; this river, which flows into the ocean approximately 30 miles north of Sydney, extends in a westerly and south-westerly direction, extending to the limits of the Sydney Basin. The sandstone is further intersected by Port Jackson on which Sydney is situated, and the Georges River and Port Hacking to the south.

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CONTENTS OF THIS ISSUE

This issue is devoted to wildflowers of the Sydney region and their garden cultivation.

HERALDING THE SPRING WILDFLOWERS



Photography by Frank Hurley *Blocks by courtesy of John Sands Pty. Ltd.*

ACACIA DECURRENS—WATTLE

From a distance all wattle trees may look alike, a mass of yellow in various tonings. In fact the 600 species found in Australia vary considerably in form from a prostrate plant, through various sizes and shapes, to medium trees. The leaf shape also varies from feathery (or pinnate) to spiky or to long broad leaves, examples of which are shown on page 171. Many past issues contain full colour plates of various species to illustrate that there is a plant ideal for every part of a landscape.

HERALDING THE SPRING WILDFLOWERS



Photography by Frank Hurley *Blocks by courtesy of John Sands Pty. Ltd.*

RICINOCARPUS PINIFOLIUS—WEDDING BUSH

In the blaze of colour of the Sydney bushland in spring, the white of the "wedding bushes" provide contrast. A bush to 4 feet, is a mass of white, it cannot be adequately shown in a colour plate, such a clear white that at times it seems the blaze of colour in the bush around is just there to highlight the spring nuptuals. See page no. 124.

Grow Sydney's Wildflowers

CULTIVATION OF SYDNEY SANDSTONE FLORA BOTH FOR SYDNEY AND GROWERS IN OTHER STATES

by H. M. Hewett, Plant Recording Officer, N.S.W. Region

The Sydney sandstone terrain supports a wide range of flora including many particularly desirable species. "Sydney sandstone" in this article refers generally to the "Hawkesbury Sandstone" as more adequately described by Alec Blombery in another article.

Although to the casual observer this bushland presents a general similarity of appearance due doubtless to the extensive distribution of many of the Acacias, Banksias, Hakeas, Grevilleas, etc., close examination reveals that many other species are restricted to localised areas or specific conditions. In fact even bush lovers of long standing experience, rarely visit an unfamiliar area in springtime without discovering some species previously unnoticed.

The subtle differences in environment associated with this diversity are frequently explained by the mystical and all-embracing word "Ecology", but members of our Society refuse to submit readily to the dictates of this phenonemon. Consequently many species are now being tried and satisfactorily established in gardens under conditions widely differing from those under which they are to be discovered naturally.

Before proceeding to discuss matters relating to garden cultivation, may I make reference to the extensive range of conditions prevailing in the Sydney Sandstone area. Examination of the immense cuttings for the new Northern Expressway discloses that whereas the basic underlying rock strata is predominantly sandstone the soils of the overburden are very variable in colour, texture and parentage. They include areas of deep light skeletal sands, light loams with or without concretionary ironstone, laterite, ironstone and shale derived clays, and a range of heavier brown to red soils associated with volcanic intrusions, etc. Furthermore, in much of the region shales are found in close proximity to the sandstone, even to the extent of being in alternate bands, and so contributing to soils of a rather mixed parentage.

Climatically also a considerable range occurs from regions of negligible frost near the coast to others of relatively heavy frost, some 10 to 40 miles inland. In altitude too, the range is from sea level to some 4,500 feet. Exposure varies from rainforest gully to ridge conditions and average rainfall (predominantly in the warmer months) varies between 30" and 55".

WARATAH—HOW DO THEY GROW?

Although this region is relatively confined geographically, generalities with regard to the soil for garden cultivation are particularly difficult to establish. For instance of an apparent anomally let me refer to the well known species *Telopea speciosissima,* our State emblem which is usually considered a product of the Sydney Sandstone, and when in fact it may be most cammonly discovered growing, but not really flourishing in rather poorish skeletal ridge conditions. Members attempting to emulate this soil condition in their gardens have had rather doubtful success, obtaining at best very few flower heads or sparsely leafed hard-barked stalks.

By contrast, specimens grown in the deep rich brown clay loam areas, or on finely textured brown loams over shale base provide a more vigorous appearance with softer wooded leafy stems sometimes furnished to

ground level and considerably more prolific in flower. It is true that good specimens such as this are to be found naturally in areas of volcanic influence such as Duffy's Forest and in parts of the Blue Mountains, but in the soil types described in the above paragraph, little evidence can be found of their natural existence.

I think this can be explained by consideration of the hazard of the fungus disease known as collar rot on damping off, to which the young "Waratah" seems to be particularly susceptible in the humid weather of our late spring. Seed falls in late autumn or early winter and germinates readily only to encounter the above weather conditions when in a very lush and soft-wooded growth. In the nursery it seems desirable to hold the plants until the following winter before handling, when natural dormancy occurs and a small ligno-tuber has developed. Thereafter they are relatively fungus resistant.

In the natural state however it seems reasonable to presume that the more open sandy conditions of the surface soils of the ridges would be less likely to harbor the attacking fungus, than would the heavier soil areas. Hence we have the position that the species has evolved and survived in the soils of sandstone parentage, but can be cultivated with better results in the heavier soils.

SOIL TYPE?

As Plant Recording Officer, I have noted other anomalies. The October-November flowering *Prostanthera linearis* is to my knowledge only found in sheltered areas on what is described in Sydney as bush sand, obviously a product of sandstone. Easily the best specimen I have seen was growing in a garden in full sunlight and in heavy brown clay loam.

So how important is the type of soil in your garden? For some it is vital but for an amazingly large range, normal good garden conditions seem desirable and these we will call the hardy plants.

THE MORE EASILY GROWN WILDFLOWERS

There are few guiding principles I could state for the garden cultivation of this flora except perhaps to say that most of the more robust genera such as *Acacia, Astroloma, Baeckea, Banksia, Bauera, Callistemon, Cassia, Epacris, Grevillea, Hakea, Melaleuca, Persoonia, Pultenaea,* etc., are very adaptable and respond very well to richer conditions, than those under which they are usually found. They are very suitable for use as specimen plants and respond well to light fertilising. Surface mulches are beneficial and better flowering occurs under full sunlight.

Species of *Astroloma* and *Epacris* and the dwarf *Baeckea ramosissima* make excellent rockery specimens and are tolerant of both wet and dry seasonal conditions. Species of *Callistemon* and *Melaleuca* and *Bauera rubioides* are particularly useful for growing under conditions of poor drainage.

MINT BUSHES AND LESS HARDY PLANTS

Of the medium to hardy plants such as the Prostantheras, generalities are difficult as some such as *P. incisa, P. sieberi* and *P. howellae,* produce the best specimens when grown under full sunlight in clay loams. Those found naturally in lighter soils seem to need broken shade.

(Continued on page 154)

DORYANTHES EXCELSA—GYMEA LILY

A feature of the Sydney bushland in some areas is the giant "Gymea Lily" (see page 161). This colour plate while showing details of the flower does not give a true picture of how this giant flowerhead, often up to one foot across will stand up on its sturdy stalk 6-8 feet above the ground. Nor does it show the large stiff typically lily-type leaves often 4-5 feet long. See page 161. The various Australian plants in the "lily" plant families are classified in our No. 26 issue.

Photography by Frank Hurley *Blocks by courtesy of John Sands Pty. Ltd.*





PROTEACEAE

A dominant feature of the Sydney wildflower scene is the many species of the various groups of plants related to Proteas. See page no. 164. The most famous is the floral emblem of New South Wales, the "Waratah". This spectacular plant has been illustrated in large colour plates in previous issues so that the small insert opposite will serve. Below is illustrated one of the lesser known Proteaceae that is quite widespread in the Sydney area.

The plant below is not as widespread and dominant as another group of Proteaceae, the well known *Banksia*, which is illustrated in full colour on page 161.



Photography by Frank Hurley *Blocks by courtesy of John Sands Pty. Ltd.*

DRUMSTICKS—*ISOPOGON ANEMONIFOLIUS*

These plants have proved quite hardy in the garden and respond well to normal garden conditions and care such as pruning and fertilizing.

CULTIVATION OF SYDNEY SANDSTONE FLORA—continued from page 151

Species that may be considered reasonably hardy when grown in the grey bush sands and light sandy loams include: *Actinotus helianthe* (Flannel Flower), *Blandfordia nobilis* (Christmas Bells), *Crowea saligna, Dampiera stricta, Gompholobium grandiflorum, Phebalium squammulosum* and *Sprengelia incarnata.* All grow best in full sunlight except for *Crowea saligna* which has a distinct preference for cool south slopes. Its sister species *Crowea exalata* may be considered in the hardy bracket having been proved very adaptable to the heavy soils and to either broken shade or full sun. *Gompholobium latifolium* seems best suited to the medium soil range although limited success has been achieved in bush sand.

GROWING THE MORE DIFFICULT GEMS

I would generalise to some extent in saying that few are happy in any but acid soils, indeed many being quick to indicate chlorosis, if otherwise situated. For those who would grow the delicate Boronia, *Eriostemon* etc., I would suggest that reasonable sunlight be available and a depth of at least 1 ft. of light sandy loam be provided. Morning sunlight seems most desirable as also is protection from the drying winds of summer. Being found naturally in close association with other low growing flora, it is difficult to maintain them as specimen plants under conditions of full air circulatian.

Now let me refer to the beautiful and delicately scented *Boronia floribunda,* which to my knowledge only grows naturally in bush sand. It is to be found however not only in the lower regions of gullies enjoying a cool environment with a high degree of natural humidity, but also on rocky hillsides or even on ridges. Although the species from all of the above locations are identical, experience has shown that plants propagated by cuttings from the former environment are very much harder to maintain under cultivation in gordens unless placed under very "soft" conditions. You may be excused for saying "so what", or "wouldn't it be obvious?", but when you buy a nursery plant or perhaps are a grower in another State how are you to find out the parentage of the specimen?

Another hazard to Prostantheras as well as to many of the smaller species of the families Rutaceae and Goodeniacea when grown under cultivated conditions in gardens, is attack by nematode. In new gardens where light soil and built-up beds are used, two or three years grace is usually available before casualties appear, often in the first hot dry weather of early summer. The infested and weakened root system cannot sustain the specimen under the adverse weather conditions. Methods of controlling this insect in our native gardens are sorely needed. In some gardens where bad infestations occur it is very difficult to succeed with many of the smaller species of the families noted above and nematode resistant plants seem to be the only reasonable answer. In my own garden one such plant appears to be *Astroloma humifusum* which continues to flourish in a section where a succession of failures were diagnosed as attack by nematode.

The disease of collar rot mentioned above in connection with young plants of *Telopea speciosissima* is along with nematode attack, probably the greatest destroyer of these more sensitive species under garden conditions.

Specimens frequently are not seriously affected for two or three years, but as with nematode attack, summer seems to be the danger period, although in the case of fungal attack the overcast periods of high day and night temperature and humidity seem to cause the trouble. I have reports of

some success in combating this disease being achieved by the use of the fungicide DEXON, and have done some experimental work with it myself.

Some assistance combating the disease may be obtained by the use of large pieces of sandstone ballast placed over the root system of the specimen in such a position that the surface soil is protected from the sun. I have often wondered whether under conditions of cultivation the surface soil adjacent to the plant stems is in a much more open or water absorbent state than that generally prevailing in natural virgin conditions, thereby trapping more moisture and so assisting the development of this fungal attack. Under natural conditions the surface soil is undisturbed, and a matting of small fibrous roots from associated flora must frequently contribute towards the sealing and drying processes. By contrast our gardens are tilled, heavily mulched, frequently hand watered and enjoy freedom from competition. The resulting growth rate is often dramatic for a season or two until the above fungus makes its pressure felt.

I do not wish to imply by the foregoing that we are wrong in attempting to cultivate under garden conditions those plants which have been shown to be especially prone to attack by fungi or nematode. Rather am I anxious to contribute a little to the understanding of their behaviour, and in so doing to encourage more members to accept the challenge to engage in their experimental growing. By such action and collation of results we may reasonably expect to make real progress towards the achievement of our aims. Many growers have achieved satisfactory results.

CONDITIONS FOR GROWING BORONIA

For species that have frequently been difficult to establish such as *Philotheca salsolifolia, Boronia floribunda, B. serrulata, B. ledifolia, B. fraserii* and *B. mollis,* I suggest the following conditions are most likely to be successful:

Use a light sand loam.
Provide very good drainage.
Use a mulch of large stones with only a light vegetative mulch.
Protect from drying summer winds.
Provide broken shade particularly in summer.
Plant in association with other plants to provide low healthy foliage nearby.
Capillary moisture from below is best.
Avoid excessive summer watering and do not water until well after sunset.

COLLECTION OF WATTLE SEED

The Forest Research Institute in Canberra is seeking the co-operation of members of the Society for Growing Australian Plants to obtain seed of two Wattle species: *Acacia binervata* (two-veined Hickory) and *Acacia elata* (Cedar Wattle). The Food and Agriculture Organization of the United Nations has requested the Institute to obtain seed from several localities throughout the natural range of distribution of the two species, for introduction trials in various countries.

The requirements are as follows:

(1) Seed to be collected from at least five, preferably ten trees in each locality.
(2) The seed must be from natural forest, not from planted trees.
(3) Crooked or unhealthy trees should be avoided; the trees are wanted for forestry use, not for ornamental planting.
(4) A pressed and dried herbarium specimen is required of each seed tree.
(5) Seed from each tree should be kept separate and each lot given the same number as the corresponding herbarium specimen.
(6) A total maximum of 10 lbs. from each locality, with a minimum amount of 2 ozs. from any one tree.
(7) The seed will be paid for at the rate of $10.00 per lb. of clean seed.

Members willing to assist are asked to write to: Seeds Section, Forest Research Institute, Forestry & Timber Bureau, Canberra, A.C.T. 2600, or 'phone Mr. E. Larsen, Canberra 818200, *before* commencing collection.

GEMS OF THE BUSH

The plant family *Rutaceae* is particularly famous in the Sydney area for the beautiful Boronias. See page no. 172 for further details. In the Sydney scene there is another plant in this family not so well known, but flowering in masses in certain areas and this is shown below.



Photography by Frank Hurley *Blocks by courtesy of John Sands Pty. Ltd.*

PHILOTHECA SALSOLIFOLIA

Whereas the other wildflowers shown in this issue are quite hardy and have been proved as garden subjects over a wide range of conditions, the plants of the family Rutaceae (with the exception of some Eriostemon and Boronia from Western Australia), have proved tricky as mentioned in the article on their cultivation on page no. 154.

THE WAX FLOWERS



Photography by Frank Hurley *Blocks by courtesy of John Sands Pty. Ltd.*

CROWEA SALIGNA

A beautiful shrub usually to three feet with flowers up to 1½ inches across it is one of the Sydney Rutaceae that has made the Hawkesbury sandstone flora so famous. See page no. 172 for other floriferous plants in this family. *Eriostemon lanceolatus* described there is very similar to *Crowea saligna* above but can grow to a larger bush of six feet.

GROWING WILDFLOWERS

FROM ALL AREAS OF AUSTRALIA IN GARDENS IN SYDNEY

by H. M. Hewett, Plant Recording Officer, N.S.W. Region

I was introduced to the Society for Growing Australian Plants by Mr. John Evans, whose name will be familiar to many members of the N.S.W. Region and who I regard as one of our most successful growers. I recall very well many of his comments re culture and the thought and effort put into the planning and development of his garden in my own suburb, and I have since come to realise that good gardens and well grown plants rarely just happen.

As Plant Recording Officer, I have received many requests for information and I have learned to approach the answers more on the basis of what thought and effort the enquirer is prepared to expend, rather than along the direct line of such a question as: "My conditions are so and so. What can I grow?"

Many of us are inspired by the sight of plants well grown in another garden, by beautiful bushland specimens in their virgin environment, or by photographs or memories of interstate or country excursions of exploration. It is not always possible to assess in advance the extent to which this enthusiasm will be maintained, so to members embarking on a new garden project, may I suggest that first they attempt to take a realistic approach and ask themselves seriously a few questions first relating to garden type.

A. Do I wish to have an all Australian garden or section of garden?

B. Will I be happy to introduce the occasional native among exotics?

C. Do I wish my garden to have a natural wilderness look, enriched by addition of an occasional selected species.

Then we must seriously examine our future plans.

D. Do I wish to grow my plants to perfection or will I be satisfied to establish a collection which could be said to merely flower or survive?

E. Do I intend to care for it in a reasonable manner or believe that in growing natives I will cut my gardening time to a minimum, on the reasoning that being indigenous, they should require less attention than exotics. There is much benefit in this latter approach but it should be adopted sensibly.

F. Am I prepared to expend money for the purchase of soil or do I intend to use only the soil at hand? In either case am I prepared to expend the effort on prior preparation and landscaping.

G. Am I prepared to attempt to grow species from different climatic zones or soil types to my own, or do I wish only to grow tried and "safe" species? If the former, am I prepared to suffer losses?

H. Am I prepared to spend time and effort on propagating from seed or cuttings? This is important as propagation of the easier species helps considerably.

While considering the above questions new aspiring, native gardeners would be well advised to visit a few established gardens of fellow members. A little friendly discussion on this basis can do much to increase understanding of different soils, aspects and gardening methods.

Five years of Plant Recording has taken me to many gardens where I have had the advantage of studying and comparing the growth patterns resulting from differing conditions and treatments, both for our Sydney flora, and for introductions from other areas.

ROOT COMPETITION

For those who would aspire to grow Australian Plants to perfection, perhaps the primary requirement for the great majority of species is avoidance of undue root competition. The factors controlling this requirement are themselves variable, and not the least is the texture of the soil. For instance, in heavy soil areas, penetration by roots of large shrubs on trees is not merely so extensive as in medium and light soils. Hence, when making plantings in heavy soils, specimens may generally be placed much closer together. Given adequate sunlight and watering, consistent of course with good drainage, the growth pattern then tends towards compact, lower growing foliage than is the case with the light to medium soil range where taller, rather open or rangy specimens are more often produced.

When seasonal weather patterns tend towards the extremes of either dryness or wetness, these differences in performance appear most evident. The period from late summer through to late spring in Sydney in 1968 was one of the driest ever recorded, but in these draught conditions I observed some well attended heavy soil gardens, which seemed to revel in the general situation. By way of contrast, where the soil was of the light to medium range, great difficulty was experienced in maintaining even moderate standards of appearance.

In this lighter soil range, large trees or shrubs exert their influence over very considerable distances, and no amount of artificial watering can offset the high transpiration rate from their foliage with the consequence that the subsoil in their vicinity is almost completely dried out, and small specimens are very seriously affected. Under these dry weather conditions the addition of surface mulches can do little to alleviate the problem.

I was particularly interested however, at the height of the above-mentioned dry period to inspect one garden which although grown in a light sandy loam, did present a picture of vigorous healthy growth. In this case ingenuity had overcome what to many would have presented an almost impossible situation. The garden site had been a steeply sloping shelf, sandstone carrying no soil overburden at all. Beds had been prepared by filling between edging stones with, as noted above, a light bush loam. Regular artificial watering had been given with the result that a large selection of Australian plants responded well to a situation where competition from the root systems of trees etc. was not existant.

EXPOSURE TO SUNLIGHT

Competition for sunlight is a factor of considerable importance where good standards of culture are sought. Generalities are always subject to being upset by occasional exceptions which don't seem to conform to the usual pattern but I would say that in the main the nearer to prostrate that a particular species grows, the more sunlight it requires.

If then rockeries are contemplated, the plants will be of small varieties and full sunlight is highly desirable.

Evidence to date suggests very strongly that the small alpine varieties in particular are not successful in Sydney unless given full exposure, although in these cases another factor, capillary moisture in the soil, seems also to be very important.

Much of the South-west corner of W.A. is forest country, and understorey species from this environment are being satisfactorily grown in Sydney under conditions of broken shade and in some instances such as *Acacia alata* and *Verticordia plumosa*, maintenance of specimens in full sunlight in Sydney is particularly difficult.

(Continued on page 186)

CHRISTMAS BELLS



Photography by Frank Hurley *Blocks by courtesy of John Sands Pty. Ltd.*

BLANDFORDIA GRANDIFLORA—CHRISTMAS BELLS

The "Christmas Bell" will become one of the most popular Australian plants grown under cultivation. They can be grown in most gardens and have an exceptionally long life. Plants in my beds are 40 years old and still flourishing—Reprinted from an article in *Australian Plants*—Vol. 2, where the cultivation of the three species of *Blandfordia* is given in detail. Flowers are often larger than that shown above.

HAWKESBURY SANDSTONE FLORA—Continued from page 147

In addition to the extensive Wianamatta shale capping, the Hawkesbury Sandstone has numerous cappings of laterite, and in some areas limited basaltic cappings. Where these occur there is a change in the flora and in favourable locations the basalt supports a rainforest flora.

The soil derived from the Hawkesbury Sandstone is of a sandy nature, lacking in plant foods, particularly phosphorus; it is of an acid nature and does not readily hold water. In protected gullies the soil is enriched by an accumulation of humus and in these situations rainforest forms of plants often grow. The plateaux of some areas provide both swamp and heathlands. The numerous gullies provide areas for extensive outcrops of sandstone cliff faces. Within this Hawkesbury sandstone, the variations in soil allow for a change in the flora and there are often different small plant communities within a limited area.

AN INTRODUCTION TO SOME COMMON FLOWERING PLANTS

LILIACEAE

The family Liliaceae is well distributed and a number of attractive species occur, well worthy of a place in the garden.

Blandfordia, "Christmas Bells". There are three species. They are herbs with long, stiff, linear leaves have a number of most attractive bell-shaped flowers of red and yellow in a raceme at the top of a long peduncle.

In the moist heathlands where these plants usually occur, *Sowerbaea juncea*—"Vanilla Plant", *Burchardia umbellata*—"Milkmaids", are also often found. Species of *Dianella*[1], *Stypandra* and *Thysanotus*[2] are common under various conditions of growth but chiefly in well-drained areas.

IRIDACEAE

There are two genera of the family Iridaceae in the area, namely *Patersonia*[3] and *Libertia*. The well known genus *Patersonia* (Native Iris) with 4 species is widely distributed; there are two species of *Libertia;* small plants with iris-like leaves and 6 petalled, white flowers; fl. spring.

XANTHORRHOEACEAE

The family Xanthorrhoeaceae is represented by the genus *Xanthorrhoea*—"Grass Trees", "Black Boy"; with 5 species widely distributed.

AGAVACEAE

The genus *Doryanthes*[4]—"Giant Lily" of the family Agavaceae with its large leaves and large head of red flowers occurs on ridges where there is an intermixture of sandstone and laterite or sandy loam.

ORCHIDACEAE

The family Orchidaceae is well represented and there are a number of terrestrial species as well as some epiphytes. The following terrestrial genera occur: *Acianthus, Burnettia, Caladenia, Caleana, Calochilus, Corybas, Chiloglottis, Cryptostylis, Diuris, Dipodium, Eriochilus, Galeola, Gastrodia, Glossodia, Lyperanthus, Microtis, Orthoceras, Prasophyllum, Pterostylis, Spiculea, Spiranthes, Thelymitra;* these orchids occur in protected positions.

Thelymitra ixioides, "Sun Orchid". This species which is widely distributed is an annual herb with a single, narrow, deeply-channelled leaf about 6 inches long, which dies down each year. The leaf arises from a

1. Species of *Dianella* are described in our No. ..... issue.
2. *Thysanotus*, the beautiful "Fringed Violet" would be our most beautiful *Liliaceae*. It is featured in full colour in No. 38 issue.
3. *Patersonia*, our Native Iris is featured in full colour in No. 88 issue.
4. *Doryanthes*. See page no. 152.

single tuber which is replaced annually. The flowers are produced on a stem 12 to 18 inches high with a few to many attractive blue to pink flowers dotted with darker spots; the flowers open and close with the bright sunlight. Fl. Aug., Sept. Cultivation can be carried out in a pot with a well drained sandy compost; care must be taken to prevent overwatering or drying out of the plants.

Pterostylis curta, "Greenhood". A common species found in half shaded positions and is one of a number of species of this genus occurring in the area, a rosette of soft green leaves is produced annually from a small underground tuber. In seasons of good rains the tubers multiply; flowers usually on a stem approximately 6 inches high—a typical greenhood with green, white and brown markings. A simple distinguishing characteristic is the twisted labellum. This speces is an excellent specimen for cultivation—grown as in *Thelymitra*—tubers multiply and should be repotted every two years in late December or early January. Fl. July-Sept.

Acianthus fornicatus. A small orchid is commonly found in shaded sandy areas; a single heart-shaped leaf is produced annually from a small tuber (as in the case of *Pterostylis* multiplies in number during seasons of good rain). A number of tiny flawers are produced on a stem 3 to 4 inches long. Cultivation is as for *Pterostylis*. Fl. July and Aug.

The sandstone outcrops in protected positions are favoured by several species of epiphytic orchids which are characteristic of the sandstone; the species attach themselves to the rock faces.

Dendrobium speciosum, "Rock Orchid". A plant forming large clumps on rocks; the pseudo-bulbs 12 inches or more in length with two to six large, dark green, leathery leaves 6 to 9 inches in length at the top of the pseudo-bulb. Inflorescences 12 to 18 inches long with numerous cream to yellow flowers produced in Sept.-Oct. This plant is very hardy, readily cultivated on a rock or other surface or in a large pot with large crocks and charcoal; during the growing season a plentiful supply of water and fertilizer such as fowl manure should be provided.

Dendrobium linguiforme, "Tongue Orchid". This orchid grows on the surface of rocks and also occurs on trees such as *Casuarina*; there are numerous thick leaves approximotely 1 inch in length and ½ inch wide, inflorescence 2 to 3 inches in length; flowers of white to cream, Sept.-Oct. This orchid is easily cultivated on the surface of rocks, the branches of paper bark trees, timber, tree fern or similar material. Plentiful supply of water and application of fertilizer during the growing periods.

Dendrobium striolatum. A plant with a creeping stem and numerous small pencil-like leaves 2 to 3 inches in length. Flowers cream to yellow marked with brown stripes—Sept. and Oct. Cultivation similar to *D. linguiforme*, also grows very successfully in a pot.

Liparis reflexa. The orchid is commonly associated with *Dendrobium speciosum*. A plant with light green soft pseudo bulbs, 2 to 4 inches in length; leaves soft, light green, 4 to 6 inches in length; flowers small, greenish yellow, in Autumn. Cultivation as in *D. striolatum*; a pot gives best results; shade is desirable.

Bulbophyllum exiguum. This small orchid commonly grows on trees but is frequently found on the surface of sandstone; pseudo-bulbs are approximately ¼" to ⅜" in diameter and the small, oval leaf approximately ½ an inch long; the small, cream to yellow flowers in autumn. It is readily cultivated and should be treated as for *D. linguiforme*.



A. *Dendrobium speciosum*—"Rock Orchid" (one pseudo-bulb).
B. *Dendrobium linguiforme*—"Tongue Orchid". Illustrated in colour in our No. 37 issue.
C. *Liparis reflexa.*
D. *Bulbophyllum exiguum.*
E. *Bulbophyllum crassulifolium.*
F. *Dendrobium striolatum.*
G. *Thelymitra ixioides*—"Sun Orchid". Illustrated in colour in our No. 20 issue.
H. *Acianthus fornicatus*—"Pixie Caps". All Australian species described in No. 28 issue.
I. *Pterostylis curta*—"Greenhood". All Australian species illustrated in No. 38 issue.

Bulbophyllum crassulifolium. Usually a tree-growing species which also occurs on sandstone; it is a small, creeping plant with numerous, light green, deeply-channelled, fleshy leaves; flowers yellow, small and inconspicuous —chiefly spring.

In protected gullies where rainforest conditions prevail species of *Bulbophyllum, Dendrobium, Sarcochilus, Plectorrhiza, Schistotylus* occur; these orchids are also found in rainforests of New South Wales and Queensland.

PROTEACEAE

The family Proteaceae is well represented and provides a number of colourful and interesting plants. *Telopea speciosissima*—"Waratah", is found growing on deep, well-drained pockets of soil amongst the sandstone but reaches its maximum development on the overlying laterite soils.

Banksia. There are 11 species of Banksia. One species, *Banksia integrifolia,* is found chiefly on the coast in sandy to heavy soils but also extends on to the sandstones; this tree with usually entire, dark green, adult, oblanceolate leaves and spikes of attractive yellow flowers, 4 to 6 inches in length. *Banksia serrata* is the largest of the species and is typical of the sandstone; it grows into a large tree with an attractive gnarled brown bark; hairy, toothed leaves and large dove-grey flower spikes, approximately 6 or 8 inches in length. Fl. Jan.-Mar.

Banksia ericifolia is one of the most attractive species; a bushy shrub or small tree with numerous, small, linear, light green leaves and flower spikes of orange red, 6 to 9 inches in length. The species are excellent garden specimens. See pp. 181 for colour plate.

Grevillea are widely distributed with many colourful species. *Grevillea punicea,* which is found in the coastal area north of Botany Bay is most attractive with its spider-like racemes of large red flowers; it varies from an upright to a spreading shrub with ellipticol to lanceolate leaves; south of Botany Bay the species G. *oleoides* grow; it resembles the former species but is simply separated by the long linear to lanceolate leaves and flower racemes being mostly sessile; both fl. from late winter to summer.

Grevillea buxifolia is fairly widely distributed and is a shrub with ovate to lanceolate leaves with the new growth covered in rusty hairs; the grey hairy flowers are most attractive; stigmatic disc oblong; fl. spring and summer.

Two species G. *sphacelata, G. phylicoides,* are closely allied to the former species. G. *sphacelata* is generally smaller in all parts and the stigmatic disc is oval; in G. *phylicoides* the leaves are generally more linear lanceolate and the stigmatic disc is oval.

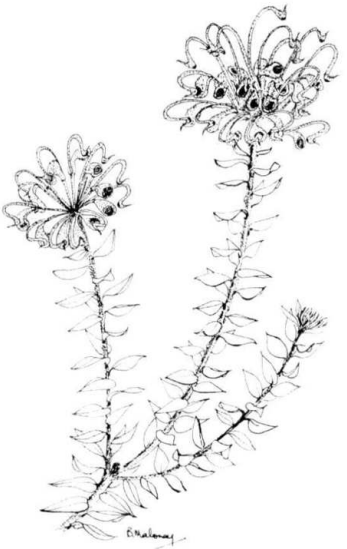
G. *sericea* is an attractive variable species with leaves from ovate lanceolate to almost linear with silky hairs beneath; the pink flowers of varying shades of pink are in close dense racemes; fl. most of year.

G. *linearifolia* is common; a large shrub with linear leaves; the flowers of white to pale pink; some forms of G. *sericea* resemble this species; fl. spring.

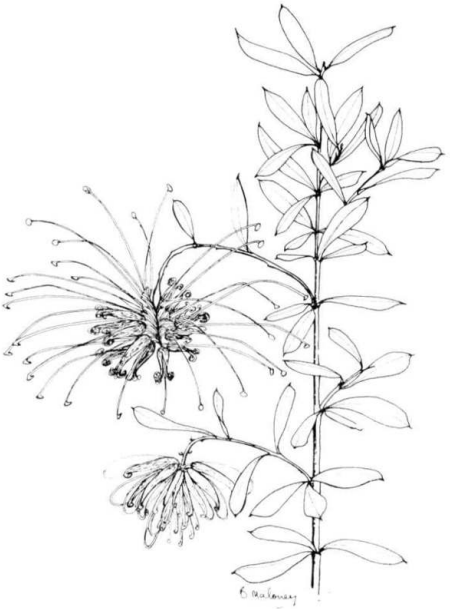
There are several species of *Grevillea* with the flowers arranged in a one-sided raceme; these are G. *caleyi, G. longifolia, G. asplenifolia, G. laurifolia, G. x gaudichaudii, G. acanthifolia.* The first two species are protected plants and are found in limited areas; G. *caleyi* occurs chiefly in laterite, G. *longifolia* along the banks of creeks. The 3 latter species are found chiefly on the Narrabeen sequence sandstone and in the Blue Mountains area. All the species are excellent for cultivation.

THE SPIDER FLOWERS









Grevillea linearifolia (white)
Grevillea sericea (pink)

Grevillea buxifolia (grey)
Grevillea punicea (red)

The many "spider flowers" are represented by the common Sydney species. They are mentioned in past issues and *G. punicea* is shown in full colour in our No. 21 issue.

Lomatia silaifolia, "Native Parsley", is distributed throughout the area; this shrub with the leaves much divided resembling large, tough, dark, parsley leaves, produces a number of flowers at the end of a long stem during the summer.

Xylomelum pyriforme, the "Native or Wooden Pear", is found in well-drained deep soils particularly in laterite; it is a shrub or small tree with attractive leaves, the juvenile leaves are prickly, toothed, and the adult leaves lanceolate to ovate lanceolate, the new growth is reddish brown and very attractive; the yellowish brown flowers are produced in dense spikes. The fruit is large, pear-shaped, woody follicle covered with dove-grey hairs.

Lambertia formosa[1], "Honey Flower", "Mountain Devil", is widely distributed both on the Hawkesbury and Narrabeen sandstone; an erect shrub to approximately 6 feet in height with a number of stems arising from the ground; the linear, sharply-pointed leaves are usually in whorls of 3; the terminal inflorescence of 7 tubular, red flowers is enclosed with an involucre of red bracts. This species as with *Xylomelum pyriforme* requires a number of years from seed to flowering stage.

Hakea is well represented throughout the area with 8 species, 6 of these are terete leaved and 2 have flat lanceolate to oblanceate leaves. *Hakea sericea,* an erect shrub up to 9 feet high with sharply-pointed, terete leaves and numerous, small, white to yellow axillary flowers; fl. during spring; large, rough fruits its representative of the terete group. *Hakea salicifolia,* a large bushy shrub to small tree with narrow to lanceolate leaves and numerous axillary creamish green flowers; fl. during spring; the fruit is rough with a distinct beak. This species has been widely cultivated for a number of years; will grow under a wide range of conditions.

Hakea dactyloides. A small to large shrub with linear to oblong lanceolate to oblanceolate leaves, 2 to 5 inches long. Where growing on heathland this species is usually an erect shrub 3 to 5 feet high with broad leaves and where growing in gullies it is often a large bushy shrub with narrow leaves; there are numerous auxillary clusters of cream flowers; fl. in spring; the fruit is smooth.

Petrophile and Isopogon, "Drumsticks"[2], are found throughout the area on both Hawkesbury and Narrabeen sandstone. The species of both genera are shrubs from 2 to 4 feet high with much-divided leaves except for one rare species, *Isopogon fletcheri,* which has entire leaves, found in the Blue Mountains on the Narrabeen sandstone. The flowers of both genera are cream to yellow in dense spikes; in *Petrophile* they are in oblang to ovoid cones and in Isopogon the cone is globular.

Conospermum. There are several species and these differ in general appearance to the "Smokebush" of Western Australia.

C. *longifolium.* A small, erect shrub with leaves 2 to 12 inches long; the small, white flowers are in a dense, terminal inflorescence; fl. spring.

C. *ericifolium.* An erect shrub with small, linear to terete leaves and a terminal inflorescence of white flowers in spring.

C. *tenuifolium.* A shrub with trailing to twining stems and long linear leaves; the small, bluish to lilac flowers are produced an slender peduncles in spring.

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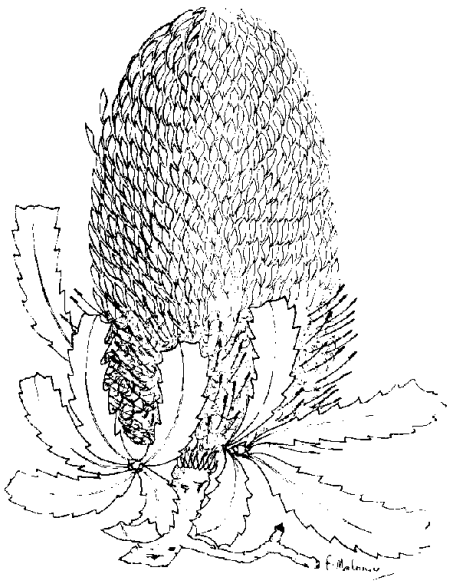
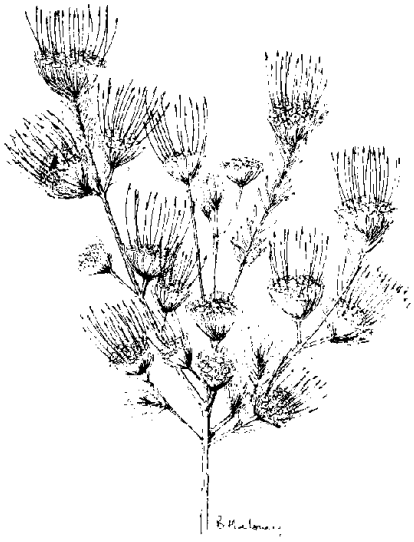
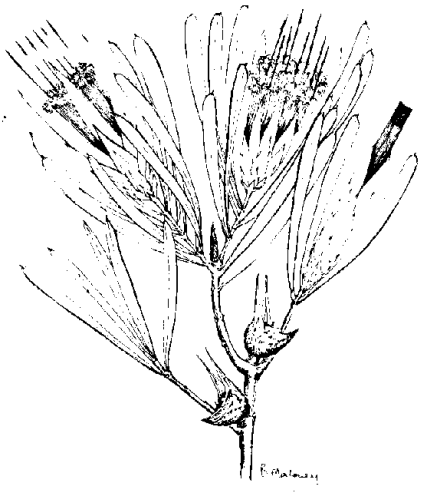
1. *Lambertia formosa.* Colour plate on cover. A tip for better flowering is to burn back established plants after flowering.
2. *Isopogon anemonifolius* is illustrated in colour on page no. 153.









Banksia serrata (page 164)
Barwinia fasciculatis (page 180)

Leptospermum squarrosum (page 176)
Lambertia formosa (see front cover)

Persoonia, "Geebung", is well represented; the species *Persoonia pinifolia*—"Pine-leaved Geebung", is one of the most attractive and is a bushy shrub 6 to 12 feet high with nemrous narrow leaves, 1 to 2 inches in length; the small yellow flowers are in dense terminal racemes in spring and summer. This species makes an attractive ornamental garden plant.

SOME SMALL HERBS AND SHRUBS

STYLIDIACEAE

Stylidium, "Tigger Plants". There are 4 species, one species, *S. debile*, being a rare annual.

Stylidium graminifolium, a herb with numerous, long, linear to narrow lanceolate leaves; 4 to 8 inches long flowers pink in racemes at the top of a long peduncle; fl. spring and summer.

Stylidium lineare, a plant resembling a small *S. graminifolium*.

Stylidium laricifolium, is a small shrub with linear leaves; the pink flowers are in loose panicles; fl. spring.

GOODENIACEAE

The family Goodenaceae is widely distributed.

Dampiera is represented by two species.

Dampiera stricta, a small erect shrub of variable growth, with a number of stems arising from the ground; leaves oval to linear with or without toothing; flowers blue in winter, summer.

Dampiera purpurea, an erect shrub 2 to 4 feet high with woolly stem and leaves; leaves elliptical; flowers purplish blue; fl. spring-summer.

Goodenia is represented by a number of species varying from the small *G. stelligera*, a small herb with linear-cuneate leaves and yellow flowers terminal in a cluster or raceme; fl. spring; to the large *G. ovata*, an erect shrub 3 to 6 feet high with ovate to broad lanceolate; flowers yellow in axillary cyme or solitary; fl. spring-summer. This species chiefly grows in heavy soils.

COMPOSITAE

The Daisy family Compositae is well represented and there are a number of naturalised introduced species.

CAMPANULACEAE

Several species of *Wahlenbergia*, "Native Blue Bell", are found. These small plants have blue flowers varying in size from minute to an inch in diameter.

LOBELIACEAE

The family Lobeliaceae is found throughout the area with genera, *Pratia, Hypsela, Lobelia, Isotoma*, the majority of the species being prostrate herbs.

VIOLACEAE

The family Violaceae has 3 genera in the area.

Viola hederacea, is common in most places; a creeping herb with reuniform to almost round leaves; flowers pale violet and white, fl. spring.

Hybanthus vernonii, a small perennial with linear to linear lanceolate leaves, flowers blue in a slender raceme; fl. spring.

UMBELLIFERAE

Actinotus helianthi, the "Flannel Flower", is very characteristic of the sandstone; a herb 1 to 3 feet high with grey, hairy, much-divided leaves; flowers cream in a dense umbel with an involucre of flannel-like bracts resembling petals; fl. spring and summer. This species if easily grown from seed and should be treated as a biennial.

A. minor is a scrambly herb with small divided leaves and miniature flower heads; fl. spring and summer.

A. forsythii occurs on the Narrabeen sandstone.

Trachymene* and *Platysace are represented by several species.

GERANIACEAE

The family Geraniaceae is represented by the genus *Geranium, Erodium* and *Pelargonium*.

BOOK REVIEWS

Available from Editor, 860 Henry Lawson Drive, Picnic Point, N.S.W. 2213.

"AUSTRALIAN INGIGENOUS ORCHIDS" by A. W. Dockrill — Price $18.00 plus $1.00 postage

Not a book that everyone can afford but easily the best value for anyone interested in Australian Orchids. The order form brochure enclosed was printed with the jacket of the book and shows how well it illustrated. It will serve to give an indication of what the book is about and how the book is presented. This is the only reference available to all Australian Orchids (epiphytic) on a technical level so will become a world-wide reference. A significant feature of the book is that while its technical accuracy and completeness is beyond question, there is also a section on each page for each species described, that translates the botanical language and metric dimensions to layman's english and terms.

"THE DRUMMONDS OF HAWTHORNDEN" — Price $5.50 plus 20c postage

James Drummond, a Scottish nurseryman, came to Western Australia in the official party of the first Governor, Sir James Stirling. The wildflowers made such an impact on him that he devoted the remainder of his life to the collection of botanical specimens to be sent home to still famous botanists such as Brown, Hooker, Lindley and Mangles. The book contains the story of how this dedicated man foresook the opportunity to become a wealthy pastoralist for the fruitless opportunity to establish a botanic garden at various sites and in desperation, after establishing the homestead "Hawthornden", his achievements in exploration and collection under trying circumstances. His family continued his pioneering work in the natural history of the colony and mention is made of many other collectors and families associated with the early development of the State. See page no. 185.

Other books by Rica Erickson previously reviewed and recommended:

Orchids of the West—Price $3.95 + 20c postage. A delightful description of W.A's. terrestrial orchids.

Trigger Plants—Price $4.50 + 20c postage. A very complete ref. illust. in colour.

Plants of Prey—Price $4.50 + 20c postage. Plants that live by trapping insects.

BOOKS ON AUSTRALIAN NATURE—SIMPLE AND ECONOMICAL

The Periwinkle Series of Books by John Childs (and other experts) — Price $1.25 + 20c postage

Each book in this series has wide appeal to all nature lovers. My teenage children find them especially interesting, they are so well written without being childish. They contain the interesting facts on the subject and are illustrated by sketches and colour plates. As an example of their contents the new releases in this series may be judged by just listing the chapters covered.

Australian Alpine Life by John Childs:

Chapter 1 is headed "Geology—Exploration and Discovery" and gives a simple explanation of how the area was formed; 2, "Short Alpine Herbfield", describes the ground covering plants; 3, "Fieldmark"; 4, Tall "Alpine Herbfield"; 5, "Plants of Bog and Fen"; 6, "Alpine Shrubs"; 7, "Insects and Other Invertebrates"; 6, "Amphibians, Fish and Reptiles"; 7, "Birds"; 8, "Mammals".

Australian Desert Life by Keith Davey:

This book arrived just in time for my son to complete a high school project on desert regions. The chapters here adequately covers the subject under the headings, "What Makes a Desert?", "Life in the Desert", "Plants and Vegetation", "Lizards", "Mammals", "Birds", "Insects and Arachnids".

Australian Eucalypts by Mervyn Millett:

Such a large subject for a small book. The book introduces the reader to general aspects of simple identification of species and then proceeds to describe in detail 33 common species, each well illustrated.

Other titles in this series and previously reviewed and recommended are:

Australian Frogs by D. Clyne.

Australian Rocks and Minerals—A very interesting simple reference.

Australian Spiders—Well presented.

Australian Insects—This has been the best reference for our purposes for years.

Australian Sea Shells—A favourite of my daughter who loves collecting shells.

Australian Pond and Stream Life—A very adequate reference of special interest to boys

Trees of the Sydney Region.

Wildflowers of the Sydney Region.

Australian Seashore Life—A treasure for those who love to gaze in rock pools.

All available from Editor, 860 Henry Lawson Drive, Picnic Point, N.S.W., 2213 at $1.25 + 20c postage.

PLANT SCIENCE—An Introduction to World Crops — Price $12.00 plus $1.00 postage

Published in America this large 630 page book is written by a different expert in each major chapter. It is produced for introducing courses in crop science combining agronomy, horticulture, forestry and agricultural economics. It treats the science of plants and the technology of crop production as twin themes with emphasis placed on the biological, physical, social and economic factors that influence crop-production practices. A valuable guide for students in agriculture and economics, but I liked it as it gave a very clear picture of the world food supplies with full details on the major foods grown.

"AUSTRALIAN PARROTS" by Joseph M. Forshaw — Price $25.00 plus $1.00 postage

This 320 page book measures 12" x 10" and weighs just on 7 lbs. A big book and big value. A lifetime's study of one aspect of Australia's natural history. There are 72 large colour plates.

ORCHIDS OF WESTERN AUSTRALIA by George & Foote — Price $1.00 + 10c postage

Just a 28 page booklet a little larger than this journal in size, it records the photographic competence of Herb Foote. Thirty-six of Western Australia's unique terrestrial orchids are described and illustrated by large clear colour plates. The photographer allows you to see the flower as whole but in such detail that you can look down the "throat" of the flower and examine all its organs. Many are the best photographs I have ever seen of terrestrial orchids.

PRINCIPLES OF DISPERSAL IN HIGHER PLANTS — Price $9.00 + $1.00 postage

Published in Germany this 150 page book by Dr. Leendert van der Pije, Professor of Botany, University of Indonesia, considers the factors effecting the dispersal of higher plants with particular consideration to ecology.

DROSERACEAE

On moist rock outcrops or moist swampy heathlands, the family Droseraceae[1] is well represented with 5 species of the genus *Drosera*—"Sundews". *Drosera binnata* is a most attractive large plant growing to approximately 2 feet high with dichotomously branched leaves which glisten with sun; flowers are attractive, large and white; fl. during summer.

LARGE SHRUBS AND SMALL TREES

MIMOSACEAE

The well known genus *Acacia* is widely distributed throughout the area.

Acacia suaveolens, a slender, erect shrub, 3 to 6 feet high, with linear to lanceolate phyllodes, 3 to 5 inches long; pale, yellow, globular flowers; heads sweetly scented; fl. autumn and winter.

Acacia ulicifolia, "Prickly Moses", a common species, is an erect shrub, 3 to 6 feet high, with tapering, shorply pointed phyllodes, slightly dilated at the base, ½ to 1½ inches long; the globular flower heads are cream and produced in spring.

Acacia echinula* and *A. brownii, are two closely allied species, in the former the phyllodes are terete and not dilated at the base and the flowers usually bright yellow; in the latter the phyllodes are flattened and not dilated at the base, whereas *A. ulicifolia* and *A. echinula* are erect in growth. *A. brownii* has thin wiry branches and spreading to prostrate growth.

Acacia botrycephala[2], "Sunshine Wattle", an erect shrub or small tree with pinnate leaves to approximately 8 inches long, the pinnules are o lighter colour beneath; the globular flower-heads are light to bright yellow; fl. autumn to late spring.

Acacia linifolia, a shrub 6 to 8 feet high with slender, often pendulous branches; the narrow, linear to linear lanceolate phyllodes are dark green and 1 to 2 inches long; the pale yellow flowers are produced in summer and winter.

MALVACEAE

Hibiscus heterophylla[3] is an erect shrub or small tree often with prickles on the stem; the leaves are 3-lobed, entire, linear or narrow elliptical; the large flowers are white with a crimson centre and are produced in late spring and summer; it is found on protected coastal areas.

Hibiscus diversifolius, a shrub with 5 lobed to entire leaves, occurs in limited, sandy, coastal areas. The large flowers are yellow with a deep red centre. Both species are readily cultivated.

***Howittia*[4] and *Pavonia*[5]** occur in the area.

CUNONIACEAE

Ceratopetalum gummiferum, the "Christmas Bush"[6], is well distributed in well drained soils. A bushy shrub or small tree with shiny, usually 3 foliate, lanceolate leaves, small, white flowers with tiny petals are produced in October, December and January. The persistent calyx lobes enlarge as the fruit ripens, calyx and lobes turn red. This species is widely cultivated.

Callicoma serratifolia occurs in protected moist gullies; a shrub to small tree with broad, lanceolate, serrated leaves, shiny above and whitish below; the small yellow flowers grow in dense globular heads; fl. Oct. and Nov.

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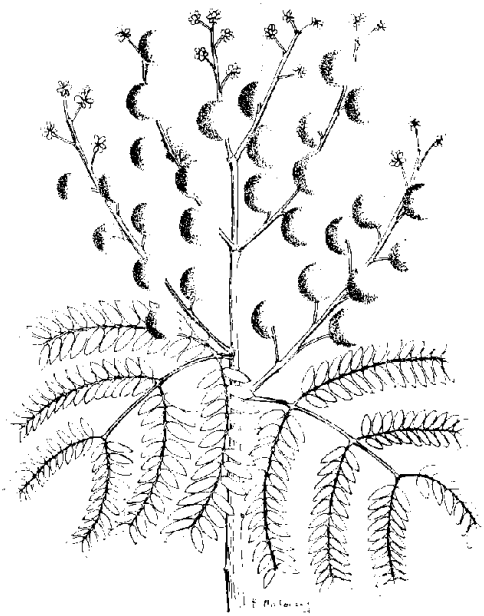
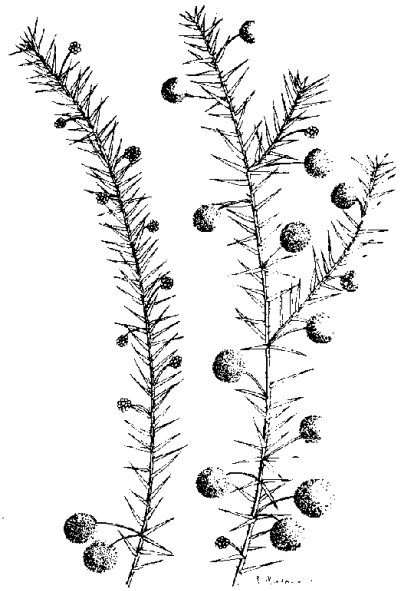
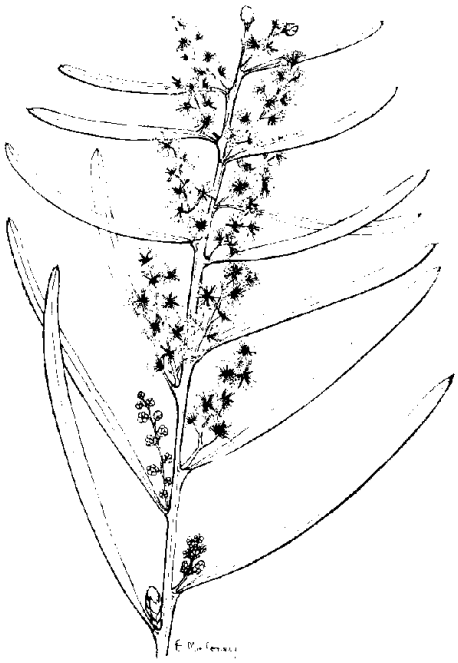
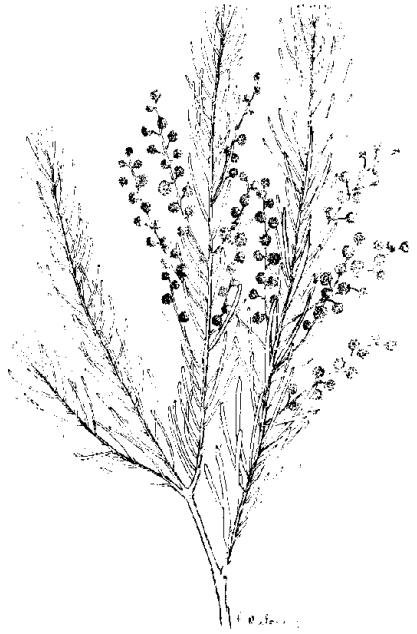
1. Droseraceae—Plants that prey on insects. Many are described in No. 35 issue.
2. *Acacia botrycephala*, "Sunshine Wattle". Illustrated in colour in No. 11 issue.
3. Hibiscus are described in our No. 29 issue.
4. *Howittia*. Described and illustrated in colour in our No. 30 issue.
5. *Pavonia*. Described and illustrated in colour in our No. 32 issue.
6. Sydney Christmas Bush. Described and illustrated in colour in No. 5 issue.

WATTLES









Acacia botrycephala (Sunshine Wattle)
Acacia suaveolens (Sweet-scented Wattle)

Acacia ulicifolia (Prickly Moses)
Acacia linifolia

THE BORONIA & WAX FLOWER FAMILY

RUTACEAE

The family Rutaceae is well represented and is particularly characteristic of the Hawkesbury sandstone and Narrabeen sandstone.

Boronia ledifolia[1], often called the "Sydney Boronia", is a shrub from 2 to 4 feet high with linear to oblong linear leaves, simple to trifoliate; the pink flowers are produced in profusion in late winter and early spring.

Boronia pinnata[2], a shrub 3 to 6 feet high with pinnate leaves; the pink flowers are in axillary cymes; fl. in spring.

B. floribunda, B. thujona, B. microphylla, resemble *B. pinnata. B. floribunda,* which is smaller in size and with finer, pinnate leaves, has soft, pale pink flowers and is one of the most highly perfumed of the genus.

Boronia serrulata[3], "Native Rose", is found in coastal areas, and is one of the most attractive species of the genus; the leaves are rhomboidal with very fine toothing. The pink flowers are in a terminal head and each flower, when in bud, resembles a tiny rose. This is a highly perfumed species.

The species are readily propagated from cutting and easily grown in well drained, cool, half-shaded position.

Zieria laevigata, resembles a *Boronia,* but has 4 stamens; a shrub up to 3 feet high with 3 foliate, linear leaflets; the flowers are white to pale pink—fl. in spring.

Correa[4] is represented by 3 species.

C. reflexa, an erect to spreading shrub with rough, heart-shaped to elliptical leaves, has red to green, bell-shaped flowers; in spring.

C. alba is found near the sea and is an erect shrub with grey leaves round to ovate; the flowers are white; fl. in spring.

Phebalium squamulosum is a common species; and is one of several species of Phebalium found; an erect shrub, 3 to 4 feet high with lanceolate leaves with canspicuous oil glands; flowers yellow in heads; fl. spring.

Eriostemon[5]. A feature of the area is the number of attractive species of *Eriostemon.*

Eriostemon lanceolatus, an erect shrub, 3 to 5 feet high, with narrow, lanceolate, greyish green leaves; flowers large, pale to rose pink; fl. July to Sept. This species is one of the most outstanding of the genus and requires well drained soil and a cool position.

Eriostemon buxifolia, an erect to spreading shrub, 3 to 5 feet high; leaves sharply-pointed, cordate to ovate to obovate; flowers white to pink; fl. Aug. to Sept.

Eriostemon hispidalus, a shrub resembling *E. buxifolia* but with linear to linear spathulate leaves, edges revolute and rough below.

Eriostemon scaber, a shrub 2 to 3 feet high with narrow, linear, warty leaves; flowers white to pale pink and smaller than the former species; fl. Aug., Sept.

Eriostemon myoporoides, this widely cultivated species is a shrub 3 to 6 feet high; leaves linear lanceolate to elliptical; flowers white to pale pink; fl. August-Sept.

Eriostemon obovolis, is found mainly on the elevated area of Narrabeen sandstone.

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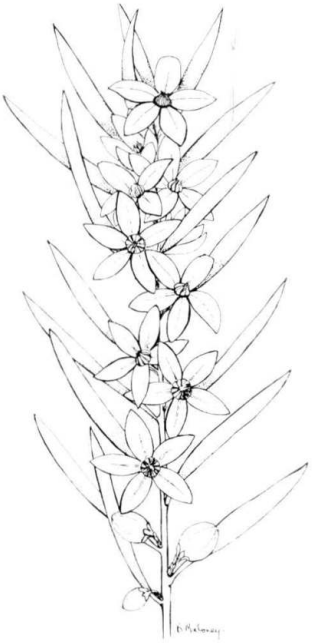
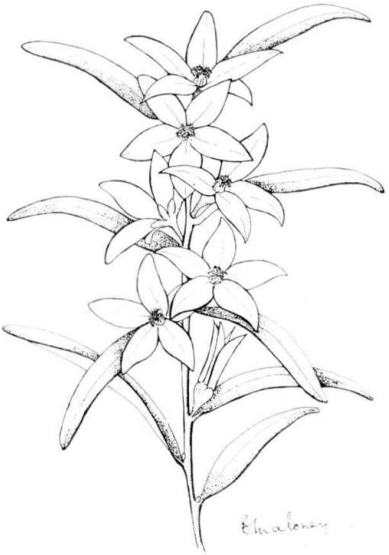
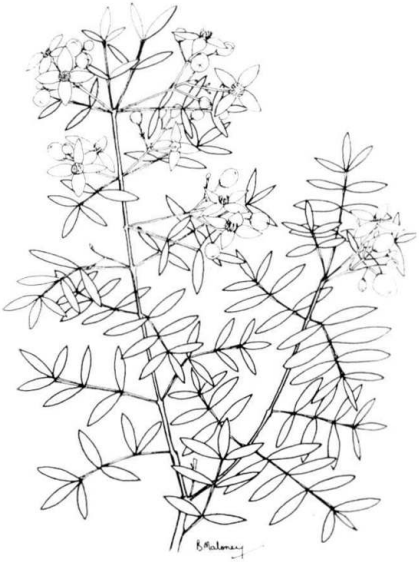
1. The Sydney Boronia have been featured in No. 17 issue with details of cultivation.
2. Boronia *Boronia pinnata.* Illustrated in colour in No. 18 issue.
3. *Boronia serrulata.* This species is featured in colour in No. 17 issue.
4. *Correa.* All species of Correa are described and illustrated in colour in No. 11 issue.
5. *Eriostemon.* The subject of a series of colour illustrated articles from No. 6 issue.









Eriostemon lanceolatus
Boronia pinnata

Crowea saligna
Boronia ledifolia

Crowea is a particularly fine horticultural genus. Colour plate p. 157.

Crowea *saligna*, a spreading shrub 2 to 3 feet high with dark green, lanceolate leaves; flowers large, deep pink. This species occurs in protected shady positions and is readily propagated from cuttings; fl. June.

Crowea *exalata*, is a shrub with linear leaves and pink flowers resembling C. *saligna* but smaller; fl. Feb. to June.

Philotheca salsolifolia, a slender shrub 2 to 4 feet high with numerous, narrow, linear to terete leaves; the terminal flowers are bluish pink; fl. Sept. to Nov. See full colour plate on page no. 156.

PAPILIONACEAE

The pea family, Papilionaceae, with a large number of genera provides some of the most conspicuous of the sandstone flora. The flowers are chiefly yellow to orange with red and brown markings and often called "Bacon and Eggs"; there are some species which have flowers from pink to red and purple.

Dillwynia retorta is one of the most common of the pea flowers; an upright to spreading shrub, 3 to 6 feet high with small, narrow, numerous, dark green leaves; the yellow flowers with dark red centres are produced in spring. There are a number of other species in the genus.

Pultenaea. There is a large number of species in this genus which closely resembles *Dillwynia*, but is easily separated by the two stipules at the base of the leaves and the two small bracteoles which extend up the calyx.

P. stipularis. This species is an erect shrub with crowded, green, narrow leaves and conspicuous stipules; yellow orange flowers are produced in terminal heads in spring.

P. flexilis is the largest of the genus; a bushy shrub up to 12 feet high with numerous, small, elliptical, light green leaves; flowers yellow, axillary late spring. This species is readily cultivated and should be more widely grown.

Hovea longifolia provides a contrast in colour to the yellow peas. It is an erect shrub, 4 to 6 feet high with linear leaves, 2 to 4 inches long and racemes of purple flowers in spring; a most attractive species.

Bossiaea heterophylla[1], is a winter flowering species; a slender shrub with flattened stem and linear to lanceolate leaves; the yellow red flowers are produced during winter.

The following are some of the more common genera: *Oxylobium, Daviesia, Mirbelia, Gompholobium, Phyllota*[2], *Aotus, Jacksonia, Sphaerolabium, Viminaria, Platylobium, Goodia, Indigofera, Kennedya, Hardenbergia.*

EUPHORBIACEAE

The family Euphorbiaceae is represented with a number of genera.

Ricinocarpus pinifolius, the "Wedding Bush"[3], is most attractive, erect shrub 3 to 6 feet with numerous, linear leaves and white flowers in spring.

POLYGALACEAE

Comespermum ericinum is the commonest of the five species of *Comespermum* in the area and belongs to the family Polygoloceae.

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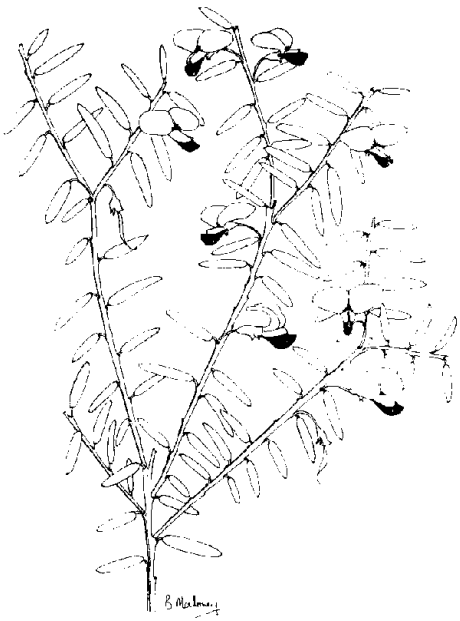
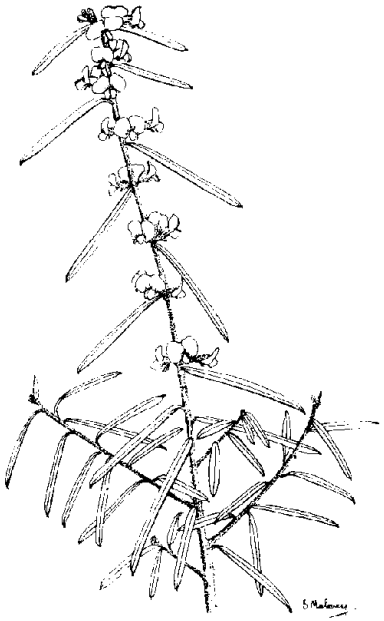
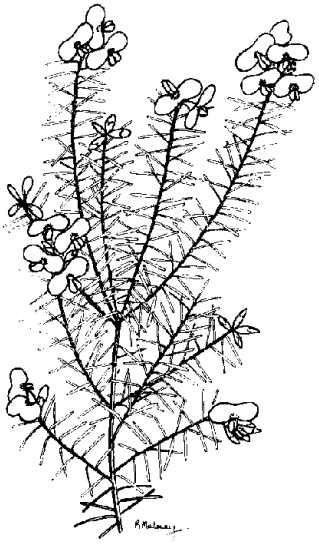
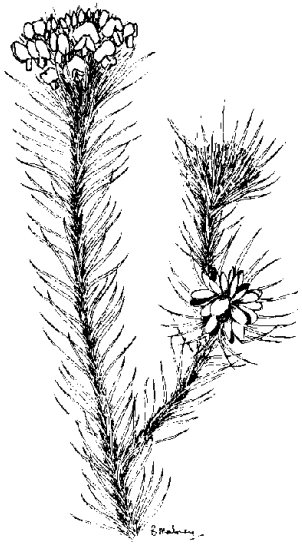
1. Featured in full colour on cover of No. 35 issue.
2. *Phyllota*—All species described and illustrated in No. 35 issue.
3. *Ricinocarpus pinifolius*—"Wedding Bush". Colour plate on page 149.









Bossiaea heterophylla
Dillwynia retorta

Hovea longifolia
Pultenaea stipularis

MYRTACEAE. The family Myrtaceae is widely distributed.

Angophora costata[1], "Sydney Red Gum", is very characteristic of the sandstone; a tall tree with smooth, reddish bark, the leaves are lonceolate and flowers white in spring or summer.

Eucalyptus[2] is well represented with a number of species.

E. haemastoma, E. racemosa, "Scribbly Gums", small to medium sized trees, depending upon the soil; the bark is smooth grey to bluish green, marked with insect scribbles; leaves narrow to broad lanceolate; flowers white in summer.

E. gummifera, "Red Bloodwood", a small to large tree with red to greyish rough, scaly bark; leaves lanceolate; flowers white in summer.

E. punctata, "Grey Gum", a small to medium sized tree, smooth to roughish bark with pinkish grey patches; leaves lanceolate; flowers white.

E. piperita, "Sydney Peppermint", a tree with grey, short-fibres bark; leaves lanceolate; flowers white in early summer.

TEA TREES

Leptospermum[3]. There are a number of species throughout the area.

Leptospermum squarrosum[4], "Peach Flowered Tea Tree", a common species of the coastal area; an erect to spreading shrub, 3 to 9 feet high, with small sharply-pointed leaves; flowers white or pink, autumn to summer.

Leptospermum flavescens, a widely distributed species, an erect shrub 6 to 12 feet high with numerous small, linear to lanceolate leaves; flowers cream to yellow in summer; this is a widely distributed species.

BOTTLE BRUSH FLOWERS

Callistemon[5] species are found chiefly in moist heath and swampy areas. *C. citrinus, C. rigidus, C. linearis* are the commonest species. All are shrubs with flowers of red to crimson; the leaves in *C. citrinus* are lanceolate, flowers spring and summer; in *C. rigidus* the leaves are stiff, linear lanceolate; *C. linearis* has long, linear leaves, flowers spring to late summer.

Kunzea. There are 4 species of the genus, two being common.

Kunzea ambigua is a common species, varying from a small, spreading shrub to a small tree; there are numerous, small, linear to linear oblong leaves; the white flowers with conspicuous, white stamens, crowded into heads.

Kunzea capitata, an erect, slender shrub with small, hairy, oblanceolate leaves and terminal heads of attractive, pink flowers in late spring.

Melaleuca[6]. There are a number of species found chiefly in wet areas.

Melaleuca thymifolia, an inhabitant of the moist heaths is a shrub from 1 to 3 feet high with lanceolate to elliptical, grey green leaves and purple, claw-shaped flower heads.

Melaleuca nodosa, a shrub 1 to 9 feet high; leaves linear, sharply-pointed flowers, white to yellow—spring and autumn.

Calytrix tetragona[7] the one species in the area is a slender shrub, 3 to 6 feet high with small, linear leaves; the pink flowers are produced in terminal heads in late spring and summer.

Darwinia[8]. There are a number of species. *D. fascicularis* is found in a number of locations and is a shrub 3 to 6 feet high with crowded, small, linear leaves; flowers are arranged in heads, the flowers are at first white and turn red as they become older; an excellent garden specimen.

Baeckea[9] **and *Micromyrtus*** are also represented.

1. Angophora—All species described and illustrated in colour in No. 7 issue.
2. Eucalyptus—This very large group of trees is mentioned frequently.
3. Leptospermum, "Tea Trees"—Described and illustrated in Nos. 30 and 36 issues.
4. *Leptospermum squarrosum*—Illustrated in colour in No. 20 issue.
5. *Callistemon*, "Bottle Brushes"—Illustrated in colour in No. 20 issue.
6. *Melaleuca.* The subject of a series of articles. Colour from No. 10 issue.
7. *Calytrix tetragona.* Described and illustrated in colour in No. 24 issue.
8. *Darwinia.* Illustrated in colour on page 181.
9. *Baeckea* and *Micromyrtus.* Described and illustrated in colour in No. 30 issue.



Photography by Frank Hurley *Blocks by courtesy of John Sands Pty. Ltd.*

EUCALYPTUS GUMMIFERA—RED BLOODWOOD

SHRUBS OF THE SHELTERED GULLIES

EPACRIDACEAE

The family *Epacridaceae*[1] is widely distributed throughout the sandstone and adds considerably to the colourful flora. The following genera occur: *Sprengelia, Dracophyllum, Styphelia, Leucopogon, Acrotriche, Montoca, Astroloma, Woollsia, Epacris, Rupicola, Melichris, Brachyloma, Trochocarpa, Lissanthe.*

In view of the large number of attractive species, 3 very common ones only are described.

Epacris longiflora[2], widely distributed in various locations; a straggly attractive shrub, 3 to 5 feet high; leaves sharply-pointed, ovate-cordate to lanceolate; flowers 1 to 1½ inches long, tube red, lobes white; flowers most of year.

Sprengelia incarnata[3], a common species of the moist heathlands; an erect to straggly shrub with sharply-pointed, stem-clasping leaves; flowers numerous and in a terminal panicle; fl. spring.

Woolsia pungens[4], this genus with one species is widely distributed; a shrub 3 to 5 feet high with crowded, rigid, sharply-pointed, ovate, acumenate leaves; flowers white turning pink to red with age; fl. winter to summer.

BAUERACEAE

Bauera rubioides[5], "River Rose", is a scrambling shrub with small 3 foliate, ovate, lanceolate leaves in whorls and pink, six petalled flowers found in moist area; *B. rubioides* var. *microphylla* also occurs in the area. These species are commonly cultivated.

DILLENACEAE

Hibbertia[6] of the family Dillenaceae has a large number of species in the area.

Hibbertia stricta, a common, vadiable species in an erect to diffuse shrub, 2 to 3 feet high; leaves mostly narrow, linear; bright yellow flowers to an inch in diameter; fl. June-Dec.

Hibbertia scandens, a climbing or trailing plant with obovate to lanceolate leaves; flowers large, deep yellow, up to 2 inches in diameter; fl. most of the year.

TREMANDRACEAE

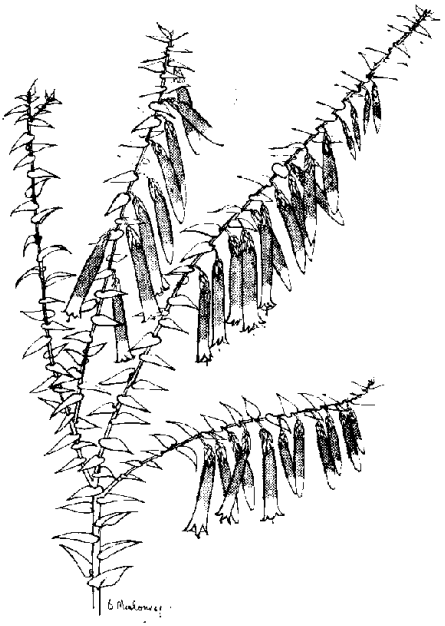
There is one genus *Tetratheca*—"Black Eyed Susan"—in the family Tremandaceae within the area the 6 species with their Boronia-like flowers and small leaves are most attractive.

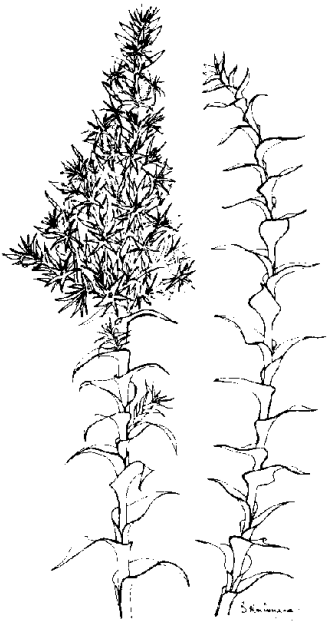
THYMELACEAE

Pimelea linifolia[7] with its white flowers is widely distributed throughout the area; a shrub 2 to 3 feet high with narrow linear leaves and terminal heads of white flowers produced through most of the year. There are 5 other species; this genus belongs to the family Thymelaceae.

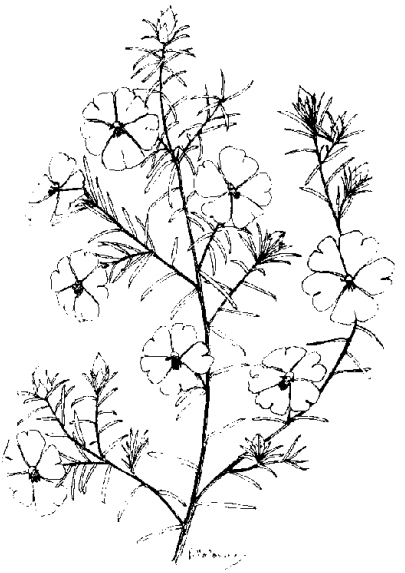
---

1. *Epacridaceae*. This large family is being described by a series of articles illustrated in full colour commencing with No. 25 issue.
2. *Epacris longiflora*, "Fuchsia Heath". Illustrated in full colour in No. 25 issue.
3. *Sprengelia incarnata*. Illustrated in full colour in No. 34 issue.
4. *Woolsia pungens*. Illustrated in full colour in No. 26 issue.
5. "River Rose" or "Dog Rose". Fully described and illustrated in full colour in No. 17 issue.
6. Hibbertia. Many species described and illustrated in colour in No. 35 issue.
7. Pimelea. Many species described and illustrated in colour in No. 24 issue.









Epacris longiflora
Woolsia pungens

Sprengelia incarnata
Hibbertia stricta

DARWINIA



Photography by Frank Hurley *Blocks by courtesy of John Sands Pty. Ltd.*

DARWINIA FASCICULARIS

A shrub 3 to 6 feet often growing in very exposed situations such as on North Head of Sydney harbour. A very variable shrub particularly as to flowering. A good flowering form must be selected. A sub-species *D. fascicularis* var. *oligantha* is found in the Blue Mountains, Wentworth Falls area. See page 176.

A SHOWY GARDEN SHRUB



Photography by Frank Hurley *Blocks by courtesy of John Sands Pty. Ltd.*

BANKSIA ERICIFOLIA

A bushy shrub or small tree the flower spikes above growing to 8 inches long. The Banksia bushes and trees are often a dominant feature of the Australian scene. This species of the Sydney sandstone flora is especially suitable for garden culture. The species illustrated on page 167 is a large shaggy tree, possibly the original Banksia-man tree. A wonderful landscaping character tree. Banksia has been featured in many past issues.

TWINING PLANTS AND SHRUBS

PASSIFLORACEAE

Passiflora cinnabarina, "Red Passion Flower", of the family Passifloraceae is found in limited shaded areas and is a most attractive climber with palmately lobed leaves and red flowers in spring.

RANUNCULACEAE

Clematis glycinoides[1], a climber with compound leaves of 3 leaflets, cordate to narrow lanceolate; flowers white in panicles; fl. spring.

Clematis aristata, resembles the former species but tends to grow chiefly in heavy soils; leaves are stiffer and irregularly toothed.

Ranunculus lappaceus, a common species, one of several in the area, has radical leaves; flowers yellow, chiefly in spring.

BIGNONIACEAE

The family Bignoniaceae is represented by:

Pandorea pandorana[2], "Wonga Wonga Vine", a climber with pinnate leaves; flowers tubular white to creamish brown with a red throat in terminal or axillary panicles; fl. spring.

LABIATAE

The family Labiatae is widely distributed with several genera.

Prostanthera[3]. A number of species of the genus occur.

Prostanthera ovalifolia[4], "Purple Mint Bush", this well known species is an erect, bushy shrub, approximately 6 feet high, with lanceolate to oblanceolate leaves, entire or slightly toothed; flowers bluish mauve to purple in short racemes; fl. spring.

Prostanthera caerulea, this species resembles *P. ovalifolia* but is stiffer in growth; leaves are smooth, stiffer and more toothed; flowers are blue; fl. spring.

Prostanthera prunelloides, an erect shrub, 3 to 6 feet high, with ovate, soft leaves; flowers large, pale lilac, in terminal racemes; a most attractive species; fl. spring.

Prostanthera incisa[5], a bushy shrub approximately 6 feet high, with small, toothed, strongly aromatic leaves; flowers violet in spring. This species is worth growing for the pleasant aroma.

Prostanthera linearis, an erect shrub with linear leaves and very pale, mauve, large flowers; fl. in spring.

Prostanthera denticulata, a spreading to straggly shrub with small, oval, minutely toothed leaves; flowers violet.

The many species are readily propagated from cuttings and should be more widely cultivated.

Hemigenia purpurea, an erect, slender shrub, 2 to 3 feet high with numerous, small, linear to terete leaves; flowers mauve in pairs; fl. spring and summer.

Westringia longifolia, a bushy shrub 3 to 6 feet high with numerous, narrow leaves; flowers white to pale lilac; fl. spring.

Westringia fruticosa (syn. *W. rosmarinifolia),* this widely cultivated species occurs in heavy soils of the sea-coast and is a bushy shrub, 3 to 6 feet high, with grey numerous, narrow-lanceolate leaves; flowers white, most of the year.

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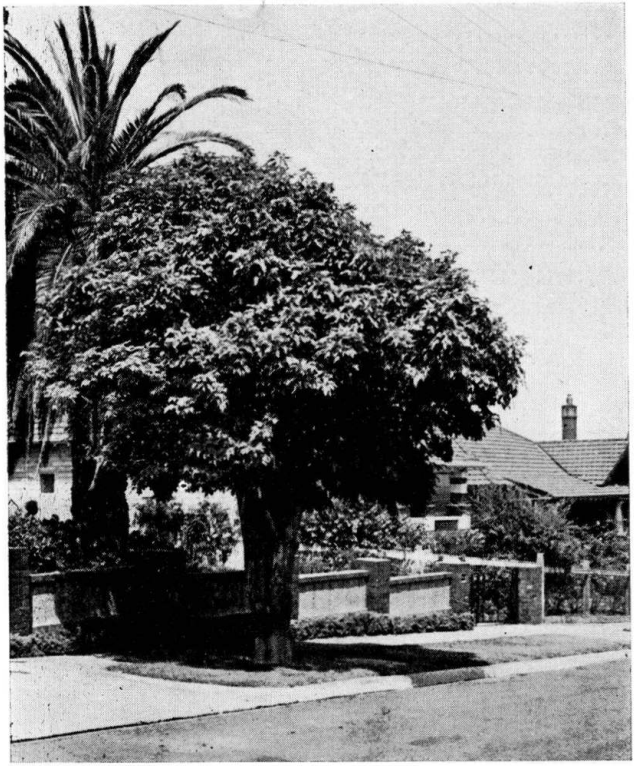
1. Clematis. Species described with other climbers in No. 36 issue.
2. Pandorea. All species in our No. 33 issue together with other common Sydney climbers.
3. Prostanthera. The mint bushes have been mentioned in a series of articles.
4. *Prostanthera ovalifolia.* Illustrated in full colour on page 188.
5. *Prostanthera incisa,* "Cut-leaf Mint Bush". Illustrated in full colour in No. 9 issue.

INTERESTING TREES

STERCULIACEAE

Brachychiton acerifolium, the "Illawarra Flame Tree", is found in rainforests.



The Illawarra Flame Tree

This picture taken by I. F. Morrison was sent for publication in our street tree series, years ago. Our street tree experts have been reluctant to present an article on it as it has proved very variable. Some are magnificent and others have been most disappointing. See page 184 for colour plate.

PITTOSPORACEAE

Pittosporum undulatum **and** ***P. revolutum*** of the family *Pittosporaceae* are found in sheltered positions. The former is a tree with shiny, green, broad lanceolate leaves, the highly perfumed tubular, white to cream flowers in early spring are followed by yellow seed capsules. *P. revolutum* is a shrub or small tree with oblong elliptical leaves and yellow flowers in late spring; the large yellow seed capsule is most attractive, particularly when it opens and exposes the bright red seed. Both species are commonly cultivated; the former seeds freely and can become a nuisance and is subject to white wax scale.

CASUARINACEAE

The family Casuarinaceae is very characteristic of the sandstone.

Casuarina littoralis, "Black She Oak", is a small tree with slender branchlets; the slender spikes of reddish brown male flowers give autumn tonings in late autumn and winter. The species are very easily grown.

ELAEOCARPACEAE

Elaeocarpus reticulatus, the "Blueberry Ash". See page 189.

The Illawarra Flame Tree



BRACHYCHITON ACERIFOLIUM

This is one of the outstanding trees of the world and is widely grown overseas . . . "it is prized in California as one of the finest flowering trees". Menninger—"The tree is grown outdoors in Scilly, off the tip of Cornwall, in Kenya it flowers at 10 years old, "a crimson mass of bloom (Gardening in East Africa); and in Ceylon "from low elevations to above 5,000 feet in the large masses of red blossom (MacMillan).

Sometimes the whole tree will be aflame, each leaf having fallen for the occasion, other years only a portion of the tree will bloom, and that part only sheds its leaves—a curious phenonemon.

All the beautiful specimen trees in the genus *Brachychiton* are described and illustrated in colour in our No. 9 issue.

THE ROYAL HAKEA

"They journeyed eastward along the coast for five days and camped a few miles short of West Mt. Barren. There he found a most extraordinary plant, a superb Hakea with brilliantly marked variegated bracts, now commonly



Reprinted from "The Drummonds of Hawthornden" by permission of Lamb Patterson Pty. Ltd.

ROYAL HAKEA *(Hakea victoriae)*. Approx. 1/3rd size.

known as the Royal Hakea, to which he gave the name *Hakea victoriae* in honour of his Queen. In writing to Hooker he gave details of its appearance.

"The most conspicuous parts of the foliage of this superb plant are its bracts. These make their appearance with the flower buds when the plant is three or four years old. They are borne in regular whorls . . . Each whorl is a year's growth of the plant after it bears its first flowers . . . The first year they are yellowish white in all the centres of the bracts, and the same colour appears in the veins, and in the teeth which grow on the margin; the second year what was white . . . has changed to a rich golden yellow; the third year the colour . . . (is) changed to blood red. The green which has a remarkably light and luminous appearance the first year varies annually to deeper and darker shades . . .".

This was reprinted from "The Drummonds of Hawthornden", reviewed on pp. 169.

WESTERN AUSTRALIA—RESPONSIBLE GOVERNMENT?

If the government of the land will not adequately protect and preserve one of the first disappearing wonders of nature of the world, who will? Where does irresponsibility in government begin in the mismanagement of such a world treasure. After reading the new book reviewed on pp. 169, "The Drummonds of Hawthornden", which relates the tale of a pioneer naturalist who worked in the face of government disinterest and often opposition, one wonders if, after 100 years, the government of our western State has really changed much. There has been a lot of talk and the development at King's Park is to its credit but is this just a device to salve the conscience and to cloud the real issue. Compared with the revenue received from tourists who go to see the wildflowers and the revenue from the development of other natural resources the investment in preserving its heritage of natural beauty is indeed insignificant.

One hopes that the magnificent initiative being shown in the development of the State in recent years will be equally reflected in the preservation and extension of natural areas of *significant* value on the same grant scale. Not only in the declaration of such areas which after all requires little initiative, but in the planned re-establishment and natural development of desirable features.

GROWING WILDFLOWERS IN SYDNEY—Continued from page no. 159

On the other hand, many of the W.A. varieties being grown in Sydney gardens hail from the "sand plain" country north and east of Perth, where the occasional low mallee Eucalypt represents the main diversion from an otherwise comparatively low foliage level. If I may risk a generality again I would say that these species show predominantly, a preference for conditions of full sunlight in our gardens. I noted many examples in W.A. of *Verticordia* species growing to best advantage on the north-eastern slopes of earth banks and other locations of warmth and in Sydney, examples I have recorded to date of these and similar species indicate a preference for the open north-east aspect, particularly in the winter months which is their main growing period.

I have no doubt that readers will consider that this article is far from complete. It is. However, the answers on how to create a wildflower garden are given if you will go back to the questions posed at the beginning of the article and consider also the advice given on pages 150 to 155. A wildflower garden has a character of its own depending on its situation and the thought that has gone into the selection of its plants and their care. It is not difficult to create but the effort must be yours.

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PURPLE MINT BUSH



Blocks by courtesy of Angus & Robertson

PROSTANTHERA OVALIFOLIA—PURPLE MINT BUSH

In the sheltered gullies one often comes upon the mint bushes massed in hues from pale blue, to deep blue, lilac to purple. The species above is world famous for its splendour, mass of colour and hardiness in the garden. There are over sixty species found only in Australia with a wide range of form from prostrate plants to large shrubs as above. They have received mention in many past issues and the printed reports from gardeners confirm their suitability and hardiness in gardens under a wide range of conditions. See page no. 182.

A SMALL SHADE TREE



Photography by Frank Hurley *Blocks by courtesy of John Sands Pty. Ltd.*

ELAEOCARPUS RETICULATUS—"BLUEBERRY ASH"

A bushy shrub or small tree with smooth greyish bark and conspicuously veined broad lanceolate leaves. Forming the understory in sheltered gullies this small tree is quite common in some areas. It has proved quite hardy and reliable as a small shade tree. See page 183.

THE SOCIETY FOR GROWING AUSTRALIAN PLANTS

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The number of books that have been produced on wildflowers must frustrate many enthusiasts who would probably prefer to spend their money on plants. In the editor's opinion there is little doubt that the periodical "Australian Plants" adequately meets the needs of most wildflower growers, students and admirers. Printed since 1959, and now in 38 issues, all but three may be obtained from the editor:

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WEST AUSTRALIAN PLANTS FOR HORTICULTURE is the latest book by this Society available from the editor for $3.00 plus 20c postage. The format of the book generally is to have simple but adequate descriptions (using simple features that anyone can distinguish) of three species in one genus with a full colour plate of one of them on the opposite page. Directions as to cultivation are given for each species. Hundreds of West Australian wildflowers are also described. This is the style of book we recommend and is excellent value at this low price. It is proposed to produce more in this series on wildflowers from other states if readers will support us by buying the first one, providing the money to produce the next one.

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STATE FLORAL EMBLEMS ON STAMPS



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WESTERN AUSTRALIA—*Anigosanthos manglesii*, the red and green "Kangaroo Paw". A herbaceous plant with short rhizomes somewhat like Iris that is readily grown from seed and cultivated as detailed in our Volume No. 2.

VICTORIA—*Epacris impressa*, "the Pink Heath", is a small tough shrub with sharp pointed leaves. The Epacrids with the quaint bell-flowers are good garden plants as described and illustrated in full colour in our Volume No. 3.

SOUTH AUSTRALIA—*Clianthus formosus*, "Sturt's Desert Pea" is a creeper from the desert interior of Australia. Experience has been gained in its cultivation under garden conditions as described in our No. 38 issue.

TASMANIA—*Eucalyptus globulus*, the "Tasmanian Blue Gum" is a worthy representative of the 600 species of Eucalyptus found in Australia. It is fully described and illustrated with other Tasmanian eucalypt in our No. 39 issue.

QUEENSLAND—*Dendrobium bigibbum*, "The Cooktown Orchid" is featured in full colour with details of cultivation in our Vol. No. 2.

N.S.W.—*Telopea speciosissima*, "Waratah", is mentioned on page no. 153.

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