

Friends of the Royal Botanic Gardens, Melbourne

Number 6, November 1983

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FROM THE DIRECTOR ...

The 'Save the Lake Appeal' was completed with a grand finale in the Gardens on Sunday the 31st October. The *Sun News Pictorial*, who had very generously celebrated their 60th birthday by mounting and sustaining the campaign, also hosted the picnic with fun for all ages and tastes. It was good to see so many family groups enjoying themselves, particularly those who had contributed to the fund which enabled the Lake to be restored to its former beauty. Everyone involved will appreciate the tremendous support given to the Gardens by *The Sun* and its highly motivated staff. Thanks are also due to those Friends who manned the information desks at the Gates & Kiosk. With 35,000 visitors to the Gardens on that day, they were certainly kept busy! Indeed, it was courteous of so many people to come to the Gardens for such an extended period and leave without a trace of damage or litter!

Sir Keith Macpherson, Chief Executive of *The Sun*, presented Mr. John Cain, Premier of Victoria, with a cheque for \$158,141.38. The ceremony was completed with the planting of an *Araucaria rulei*, Graceful Pine, by the Premier and a *Hibiscus insularis*, Norfolk Island Hibiscus, by Sir Keith, in one of the beds near the Kiosk.

DAVID CHURCHILL
Director and Government Botanist



FROM THE CONVENOR ...

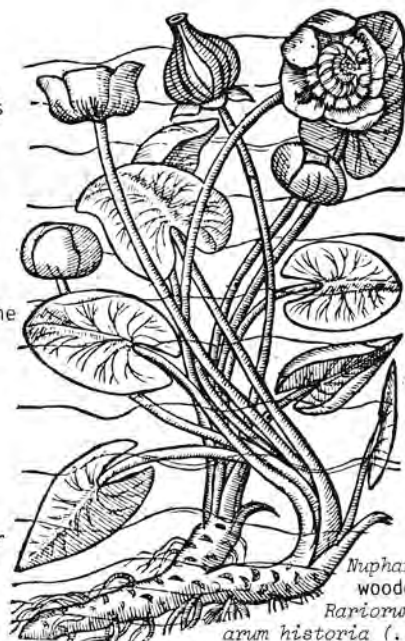
A serpent emerging from the Lake, colonial music and folk dancing on the Australian Lawn, a Bunyip on Dog Flat, soft strings wafting across the Oak Lawn and thousands of people picnicking in the Gardens on a lovely Spring day. For some, it was a 'first ever' visit.

This was the celebration planned by *The Sun* as the finale to the 'Save the Lake' campaign. Our thanks go to the Chief Executive of

The Sun, Sir Keith Macpherson and his staff for their untiring efforts, the State Government for their assistance to the cause, and their contribution and particularly the general community for their spontaneous generosity.

The Premier, Mr. John Cain and Mrs. Cain were on hand to receive the cheque and mingled freely with the crowd. It was the biggest picnic held in the Gardens for many years, and certainly very successful.

Your Steering Committee have been working hard in the background and my thanks- and I'm sure yours, to them for their loyal support. We have prepared a varied programme for the coming year, starting with a very special invitation on the 19th February to visit 'Cruden Farm' the lovely garden of Dame Elisabeth Murdoch.



Nuphar luteum,
woodcut from
Rariorum plantarum historia (...), 1601,
from the Herbarium Collection.

We would welcome your reaction to the events we offer as the organisation still in its formative stages, needs feed-back from its membership. Please ring us or write with any suggestions you may have.

My Christmas and New Year greetings to you and I look forward to meeting you at 'Cruden Farm'.

BETH HIGGS
Convenor



A NEW NAME ...

On November 2nd, 1983, the Department of Crown Lands and Survey ceased to exist formally. With the Forests Commission of Victoria and part of the Ministry for Conservation a new department has been created, the Department of Conservation, Forests and Lands.



Editorial Committee:

Dianna McClellan:	Convenor and Joint Editor
Joan Nesbit:	Joint Editor
Eve Almond:	Interpretation Officer, Royal Botanic Gardens and National Herbarium

NEW YEAR ACTIVITIES

We have decided not to add to the hustle and bustle of the Christmas season by having an end of the year celebration. Instead we're planning an interesting late summer - early autumn calendar. Here are two dates to mark in your diary now.

Sunday 19th February Visit to 'Cruden Farm', Langwarrin,
the beautiful garden of Dame Elisabeth Murdoch.
Afternoon tea to be provided. Please be there by 2.30pm, parking
is available at the rear of the stables.

R.S.V.P. 8th February

Entry by ticket only
(Limited to members & their
immediate family)
Non-members \$4.00

Members \$3.00

To obtain tickets please write to the Ticket Secretary, enclosing your remittance and a self addressed envelope. Cheques and postal orders should be made payable to the *Friends of the Royal Botanic Gardens, Melbourne*; the address is:

The Ticket Secretary
Friends of the Royal Botanic Gardens, Melbourne
c/- The National Herbarium
Birdwood Avenue
South Yarra. 3141

Wednesday 29th February Friends' General Meeting at the Herbarium to consider the Constitution and Trust Deed. This will be accompanied by twilight festivities in the Gardens. Further details following in the new year.



'CRUDEN FARM' - Dame Elisabeth Murdoch's Garden

The Friends are delighted to have been invited to visit Dame Elisabeth Murdoch's property on Sunday 19th February at 2.30pm. The enchantment of the garden at Cruden Farm is well known as an inspiration to lovers of beauty. The gently curving driveway is framed by numerous tall Lemon-Scented Gum trees, *Eucalyptus citriodora*, some of which are more than 50 years old. The white two-storeyed timber house has remarkable tall columns reaching the full height of the facade.

Parts of the garden were designed by Edna Walling in 1929-30, for example the two walled gardens to one side of the driveway and built from stone quarried on the site. However, Walling's planting of standard crab-apples and espaliered fruit in the larger and roses in the smaller gardens proved unsuitable. The upper garden now has herbaceous plants and the smaller garden has been paved with old bricks. Stone steps designed by Walling lead from the larger garden down to a pear-shaped swimming pool. Leslie Bowles designed the brolga sculpture on the gateway to the walled garden.

Today after 50 years of nurture and development the garden can be said to reflect the skills and preferences of Dame Elisabeth.



MORNING COFFEE, BOTANY AND BEAUTIFUL GARDENS

We feel our programme this year has been both interesting and diverse - by your attendance you have signified your approval so we are doubly pleased. All present at our recent Morning Coffee very much enjoyed visiting famous English gardens and others with Beth Higgs following Beth's recent overseas garden tour. The English certainly seem to warrant their title as the world's most accomplished gardeners, the weather so conducive to maintaining these, in some instances centuries-old gardens, at the peak of perfection. Our thanks to Beth for sharing this beauty with us.

A Botanist in Eastern Europe

On 20 September 1983, the Friends enjoyed a lecture on A botanist in eastern Europe by Dr Mark R. D. Seaward of Bradford University, U.K.

Mark gave a graphic account of the trials and tribulations a botanist may expect to encounter in countries where there are communication difficulties, excessive bureaucracy, shortages and censorship. He referred to the lack of books, photocopying facilities, maps and other fundamental requirements for botanizing which we take for granted.

Mark concentrated mainly on his work in Poland over the past six years. Before discussing the numerous lines of his botanical research, he described the country's general topography, climate and soils; he also outlined, mainly by means of slides, the agriculture and the semi-natural and natural vegetation. The impact on the vegetation of tourism, urbanization and industry, was also discussed.

Polish efforts to conserve the country's flora were cited, but certain reservations were expressed in respect of particular projects: for example, the preservation of the Bialowieza Forest had educational merit in demonstrating the phenomenon of degeneration and regeneration in a woodland, but did not approximate to the mixed *Quercus* woodland of times past since it was now dominated by *Carpinus*; in another case study, the use of fencing to exclude all intruders, both human and animal, from a quarry in order to protect an interesting bryophyte flora had, within a short space of time, become overgrown to the detriment of the very plants it was desired to protect; similarly, interesting thermophilous lichen sites, which in the past had been maintained by occasional scything, had degenerated when designated a reserve and farmers banned from cropping the hay.

We are most grateful to Mark for providing such an interesting and entertaining evening for the Friends.

Louisiana Wild Flowers

It was a great pleasure to welcome Miss Margaret Stones as our guest to Morning Coffee at the National Herbarium on Thursday 6th October. Miss Stones is world renowned as a botanical artist. Born in Colac, Victoria she studied at Swinburne and the Melbourne National Gallery Art School. For many years her home has been in walking distance from the Royal Botanic Gardens, Kew, England.

After mingling informally with the enthusiastic gathering, Miss Stones spoke about her present work portraying many of Louisiana's wild flowers. It is a 10 year project to be completed in 1986 involving watercolour drawings of 200 of the 2,500 species of the wild flowers growing in Louisiana. The drawings have been commissioned by Louisiana State University (LSU) and funded through private donations by the LSU Foundation. Miss Stones visits Louisiana twice a year, six weeks in the Autumn and two months in the Spring so as to gather and work with fresh material. Although there are no plans to publish her work a catalogue will be produced.

Miss Stones may be well known to you for her beautiful illustrations in the multi-volumed *Endemic flora of Tasmania*. Until recently she was the major contributing artist to *Curtis's botanical magazine*. Although Miss Stones has undertaken many botanical illustrations for the Royal Botanic Gardens, Kew she has worked independently of this institution and so has had the freedom to pursue many and varied projects. We thank Miss Stones for visiting the Friends and for making this such a memorable occasion. We also thank Helen Cohn the Herbarium and Gardens Librarian for arranging a very interesting exhibition of some of Miss Stones' work.



Brachycome decipiens,
line drawing by
Margaret Stones.
From the Herbarium Collection.

Friends' Visit to the Central Highlands

Tuesday 25th October proved to be a beautiful sunny day in Castlemaine in contrast to cloudy Melbourne. Over 70 Friends visited Buda, the historic home and garden of the Leving family which is now cared for by the Castlemaine Art Gallery and Historical Museum. We lunched in the Castlemaine Botanical Gardens.

Buda has one of the loveliest old-world gardens imaginable, with masses of lovely old-fashioned flowers, heavy-laden Lilacs scenting the air, Hawthorns and Rhododendrons in full bloom, and hundreds of beautiful red poppies.

Both Buda and the Castlemaine Botanical Gardens are associated with Baron von Mueller. He was a close friend of Ernest Leving, the

Hungarian silversmith and goldsmith who bought Buda in the 1850s. Mueller stayed with the Leving family on a number of occasions and more than likely was involved in the design of the two hectare garden which was established in the 1860s. Certainly he provided seeds for some of the plants. Through Mueller's friendship with Leving, the Castlemaine Botanical Gardens were liberally stocked with trees and shrubs from the Melbourne Botanic Gardens.

At Buda we were shown some superb examples of Leving's work as a silversmith and exquisite tapestry pictures embroidered by his talented daughters.

The Friends also visited Badger's Keep which is run by Mr. & Mrs. Clive Winmill. The 19th century stone house is surrounded by a charming garden which extends into the nursery proper. The bright orange Californian Poppies made an attractive blaze of colour. We had fun seeing and choosing unusual plants. All in all, a very pleasant and enjoyable day.

The Botany of Captain Cook's Voyage

We were indeed honoured to have such a distinguished British botanist as Professor William Stearn lecture on Thursday evening 10th November on 'The botany of Captain Cook's voyage'. The lecture's relevance to Australian botanical history together with Professor Stearn's many amusing anecdotes provided an entertaining and informative evening. We thank Professor Stearn for including Melbourne on his itinerary.

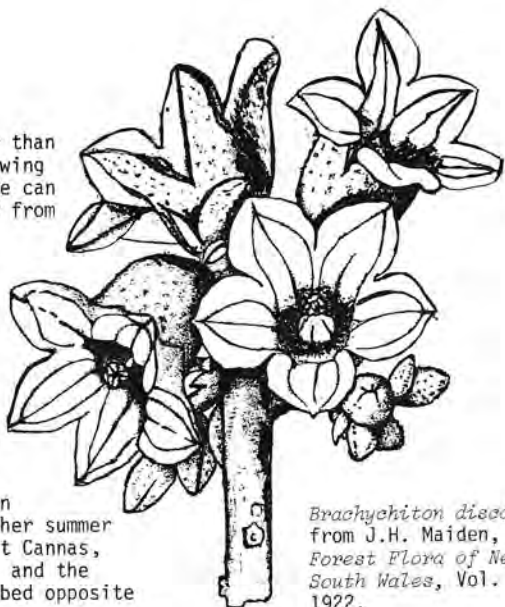


Viola tricolor,
one of the
parents of the
garden pansy:
woodcut from
*Raniorum
plantarum
historia (...)*,
1601.

SUMMER IN THE GARDENS

The Gardens are looking greener than they have for many months following the record rains in October. We can now anticipate a bright display from our summer flowering plants.

The Hydrangeas will be most spectacular on the Northern Lawn, bordering the Ornamental Lake, opposite the Kiosk. Others can be seen in the beds near the Bell Shed and on the Princes' Lawn. The eastern beds on the Princes' Lawn contain an interesting collection of Fuchsias as does the large triangular bed between the Princes' and Oak Lawns. Other summer favourites include the brilliant Cannas, best seen on the Southern Lawn, and the colourful Kangaroo Paws in the bed opposite the Nareeb Gates (Gate D).



Brachychiton discolor,
from J.H. Maiden,
*Forest Flora of New
South Wales*, Vol. 7.,
1922.

Two Australian native trees which are summer flowering are the *Brachychiton acerifolium*, Illawarra Flame Tree and the *Brachychiton discolor*, Queensland Lace-bark. A good example of the Flame Tree is on the Eastern Lawn near the Palm Lawn, quite close to the related *Brachychiton rupestris*, Queensland Bottle Tree. The Lace-bark can be seen in the Australian Border opposite the Nymphaea Lily Lake. Not too far away, on the south-east corner of the Nurseries and Workshop Yard is another striking tree, an *Erythrina secundifolia*, Scarlet Coral Tree.

The heavy rains were not, however, without their cost. A large *Liriodendron tulipifera*, Tulip Tree on the eastern edge of the Oak Lawn simply 'slid' over and the rapid rise of water in the Ornamental Lake disturbed many of the nesting swans and ducks. The birds had built their nests low down on the excavated Lake's edge, in some cases below the 'normal' water line.

By the beginning of November there appeared to be only one pair of swans still left sitting on eggs, their nest was high and dry on Baker Island. However we are confident that once the Lake levels have stabilized, the birds will be back - with young!



BANKS' FLORILEGIUM

A second exhibition of plates from *Banks' Florilegium* are on show during early December at the Gryphon Gallery, Melbourne College of Advanced Education, 757 Swanston Street, Carlton. Gallery hours are 10.00 am - 4.00 pm Mon - Sat. (Dec 5th - 16th) Admission Free.

FIELD WORK IN WESTERN AUSTRALIA

Spring seems to have been a busy time for the Herbarium staff with at least half the botanists out on field trips. Among those who travelled to Western Australia are Stephen Forbes and Philip Short, Margaret Corrick and David Churchill. A brief but most interesting account of the trip taken by Stephen and Philip is given below.



Acacia aneura,
from J.H. Maiden
Forest Flora of
New South Wales,
Vol. 16., 1907.

Philip's research into the relationships in a diverse group of daisies (family Compositae, tribe Inulae, sub-tribe Gnaphalinae) attracted another Australian Biological Resources Study grant this year. The 1983 grant allowed Philip two months field work collecting seed in Western Australia where generic problems are most apparent. The first month (October) was to be spent between Kalgoorlie and Carnarvon and the second month in the South-West. With the major cost being borne by the Commonwealth, the opportunity arose for a general collector to take advantage of the spare seat in Philip's station wagon, and I was fortunate enough to 'go west' with six pairs of plant press frames, some hundreds of cardboard boxes plus Philip on October 1.

Of course general collecting usually aims to catch plants in flower while my companion was determined that blooms should be quite finished in order to harvest ripe seed. My aims were adjusted accordingly and were firstly to collect good herbarium material of fruiting plants and secondly to collect fruits and seeds for the Gardens. A dearth of fruiting material often hampers taxonomic work - collectors are drawn to a plant in flower but fruits are usually rather cryptic and often ignored. The Gardens are always anxious to obtain good, wild collected seed with an authentically determined voucher specimen lodged in a Herbarium - such seed is valuable both for propagation and exchange and can form a basis for new horticultural introductions.

Working across from Kalgoorlie to Carnarvon through the station country one is generally immersed in low open-woodland dominated by *Acacia* spp. - quite a contrast to the Victorian mallee. Generally *Acacia aneura* (Mulga) is dominant, a soft blue-grey leafed species which forms, stands hundreds of square kilometres in extent. Salt lakes support the most diverse flora in such country and our route linked a number of isolated systems. Diminutive ephemerals only a few centimetres high and extremely restricted in distribution (often known only from a single drainage basin) were collected with special interest in anticipation of range extensions and even new species. Families such as the Compositae (Daisies), Haloragaceae (Raspworts), Gramineae (Grasses), Zygophyllaceae (Twin-leaf) and Umbelliferae (Pennyworts) are well represented in the ephemeral flora and *Dithyrostegia amplexicaulis* and *Neosciadium glochidiatum* were particularly exciting finds. The shrub layer is typically of Chenopodiaceae (Salt Bushes), Aizoaceae (Noon Flowers) and *Eremophila* spp. (Emu Bushes). The first two of these families are commonly succulent-leafed species which are very poorly collected. Collectors are deterred by the often insignificant flowers, the difficulty of drying and problems of identification. More than half of the 400 specimens that I collected would fall into one of these groups.

The *Acacia* woodlands can support a dazzling array of everlastings (*Helichrysum*, *Helipterum* and *Schoenia* and *Ptilotus* (Lamb-tails), however this year's rainfall was insufficient to produce such a spectacle.

The bizarre flora of Western Australian heathlands, was only encountered in passing as the quarry of the ABRS grant is best developed on salt lake margins. However a few stops around Kalbarri and the wheatbelt on our return trip to Perth leave a vivid impression. Waving white plumes of *Grevillea leucoptera* and the spectacular red flowered *Eucalyptus macrocarpa* (Mottlecak) are particularly memorable. (Proteaceae - *Grevillea* family and Myrtaceae -

Eucalyptus family contributed more than one quarter of the numbers collected and the majority of seed collections - a disproportionately high percentage due to their horticultural significance and ease of collection.



Fruit, *Eucalyptus maculata*, from J.H. Maiden, *A critical revision of the genus Eucalyptus*. Vol. 2., 1910.

STEPHEN FORBES
National Herbarium



'SUDDENLY, AS RARE THINGS WILL, IT VANISHED',

(Robert Browning)

Native Plants Facing Extinction or At Risk

Australia has a unique flora with about 85 per cent of the species found only in this country. While about 28,000 species have so far been recorded there are thousands waiting to be named and described. It is estimated that in less than 200 years, 76 Australian species are thought to have become extinct and about 200 are on the endangered list. It is very likely that many more species have become extinct before botanists could describe them. A study at the end of the 1970s lists more than 2000 Australian plant species as actually or potentially at risk.

We know that we no longer have the Queensland Squirting Cucumber and the Darrigo Daisy-Bush. Their extinction is permanent! Plant lovers understand the need to preserve species of plants both for their aesthetic value and possible economic importance. In the late 1940s the Australian Phytochemical Survey undertaken by CSIRO and universities screened more than 4000 species of native plants for physiologically active compounds and identified more than 400 new compounds. Some species from which active compounds were isolated are now grown as major sources of drugs, for example the *Tylophora* bushes contain compounds with potential in the treatment of cancer, and other plants have been used by chemists as the basis of synthetic chemicals.

A number of early botanists recognized the horticultural value of our flora, and collected herbarium specimens, seeds and living plants and sent them back to Europe, but early settlers to Australia showed little interest in their cultivation except for the spectacular or impressive species as the Waratah or the Moreton Bay Fig tree. Today Australian gardeners and landscape architects make use of more than 2500 native plant species. The Society for Growing Australian Plants plays an active role in encouraging the use of Australian plants in gardens, and in 1981 the Australian Flora Foundations was established to 'foster research into the biology and cultivation of the Australian flora', which should include the selection of superior forms and the hybridization of plants.

THREATS TO SPECIES EXTINCTION

Extinct and endangered Australian plants, soon to be published, and written by several authors, including Dr John Leigh of the CSIRO Division of Plant Industry who has studied our endangered species for some years, it is shown that the greatest numbers of extinctions have occurred and most endangered species are found in those parts of the country that have been intensively developed for urban, agricultural, and pastoral uses. These areas are the south-west of Western Australia, southern Victoria, and the eastern coast of New South Wales. It is believed that 57 (73%) of the species presumed extinct and 170 (85%) of the endangered species have been adversely affected by agriculture or grazing. This is not surprising as the vegetation type most commonly cleared for food production is woodland which often has the highest number of extinct and endangered species.

Forestry, roadworks, mining and quarrying, horticultural collecting, competition from introduced plants, urbanization and industrial development can all be instruments in the extinction of plant species. However grazing and agriculture are recognized as the most widespread and continuing threats as shown in the table on next page.

Threat	Number of species presumed extinct	Number of endangered species	
		past threat	present and future threat
grazing animals			
domestic	31	42	44
feral	23	19	25
native	3	4	6
agriculture	46	157	109
forestry	1	14	12
road-works	1	8	54
mining and quarrying	1	5	19
urbanization and			
industrial development	7	22	23
horticultural collecting	0	3	13
fire			
too much	4	4	26
too little	0	1	3
competition	2	3	55
herbicides	0	7	8
low numbers	0	0	25
miscellaneous	1	8	21
unknown	15	9	0

TABLE SHOWING THREATS TO AUSTRALIAN PLANT SPECIES, PAST PRESENT AND FUTURE. THE NUMBER OF SPECIES PRESUMED EXTINCT IS GIVEN.

Forestry. Attitudes like the first Conservator of Forests in Western Australia who in 1917 saw forests as '...irritating excrescences on the face of the Earth, to be sawn up, ring-barked or otherwise destroyed' have contributed to the extinction of one plant species and the endangering of 14 others. Seven of these are still endangered through forestry activity and in recent times five more have been added to the list. Plantation forestry, which involves replacing the natural vegetation with a monoculture, usually Radiata Pine, is the greatest threat. In forests where the removal of logs for milling is followed by large-scale harvesting and chipping of the remaining trees, the surviving and regenerating plants give rise to a flora distinctly different from the original. Often biological surveys carried out before such an onslaught of the vegetation have concentrated on tree species so that an inadequate account is given of understorey vegetation, including the occurrence of rare or endangered species.

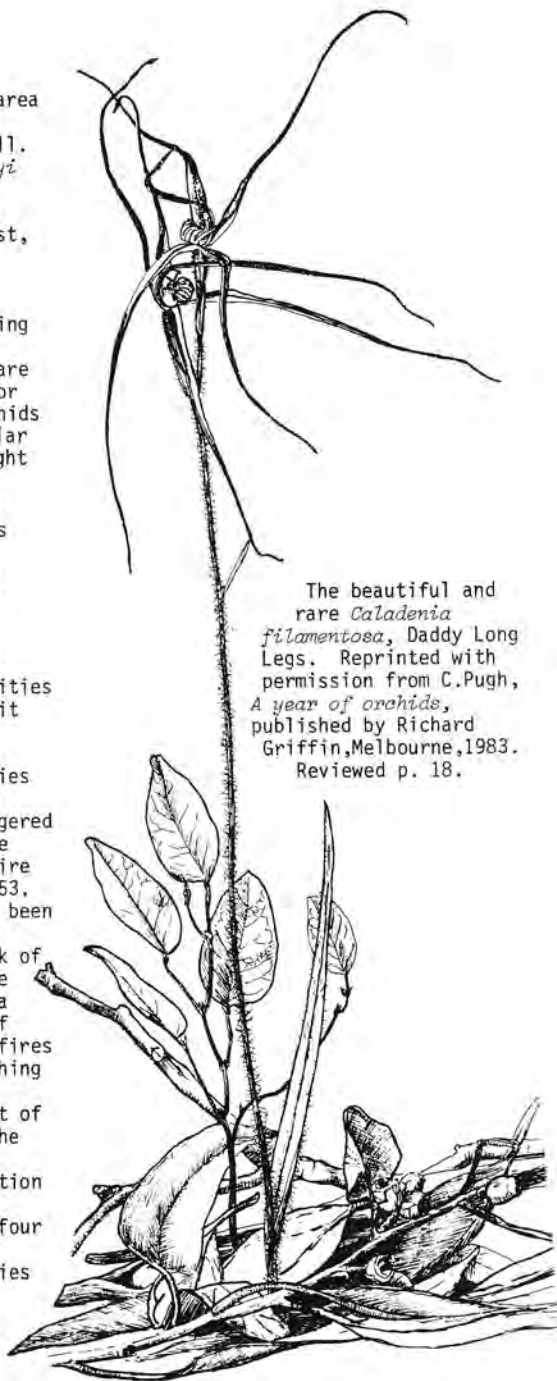
Roadworks. Remnants of nature vegetation in many parts of rural Australia are in 'the long paddock' which is the narrow strip of land between the road and cleared land. The understorey is frequently damaged by repeated burning, moving and stock-grazing. Species hanging on in these roadside refuges have no long-term security.

Mining and Quarrying. The total area of land being mined and used for quarrying is still relatively small. Only one species *Heterachne baileyi* is thought to have become extinct through mining, and although five species were threatened in the past, these and another 14 are now endangered.

Horticultural Collecting. Flowering stems or fruits are used in the florist trade while whole plants are removed for selling to nurseries or planting in private gardens. Orchids and insectivorous plants are popular with some rare species highly sought after and attracting high prices. Although no Australian species is believed to have become extinct as a result of over-zealous horticulturalists 13 species have been placed under threat, nine of them Orchids.

Fire. Many Australian plants are adapted to fire of various intensities and frequencies. Some depend on it for their very survival. It is suspected that the purple double-tailed Donkey Orchid, a rare species of ground orchid occurring on the outskirts of Melbourne, was endangered by lack of fire. Nine plants were counted in 1981, but subsequent fire appeared to raise its numbers to 53. This spring even more plants have been counted. Three other species are considered endangered through lack of fire. Too-frequent fire is a more common danger. *Acacia pubescens* a Wattle that grows on the fringe of Sydney, is at risk from frequent fires that prevent the plants from reaching maturity. - Controlled-burning techniques suited to the mangement of commercial forests may not suit the understorey and so should not automatically be used in conservation areas. Fire is believed to have contributed to the extinction of four species. Unsuitable frequency of fire is considered to put 22 species in danger.

The beautiful and rare *Caladenia filamentosa*, Daddy Long Legs. Reprinted with permission from C.Pugh, *A year of orchids*, published by Richard Griffin, Melbourne, 1983. Reviewed p. 18.



Competition. Exotic plants have been introduced into Australia, some accidentally. At least three species, the Native Thornapple, the Potato Tree, and the Tamarid, are believed to have been introduced by camping Spanish and Portuguese traders before the First Fleet arrived. Undoubtedly most introductions appeared after 1788 such as the common fruits, vegetables, cereals and garden plants. Some of these plants have escaped from cultivated areas and compete with the natives. It is estimated that in Victoria alone during the last century this happened to five or six alien species a year. Escapees have become most readily established on road verges and abandoned farmland but others have taken hold in relatively undisturbed bushland such as Lantana, Gorse, Privet, and Prickly Pear. Two species, *Festuca benthamiana* and *Hydatella leptogyne* are thought to have become extinct at least partly through competition and it is estimated that more than 50 species could be considered endangered by this threat.

Introduced Animals. Rabbits graze plants very close to the ground and, as well as grasses and other herbs, they eat young shoots of trees and shrubs, leaves, roots, and even bark. Many botanists consider the most serious threat to the conservation of remaining mallee vegetation to be the destruction of seedlings by grazing rabbits. Other animals such as feral goats, camels, donkeys and wild horses have adversely affected native vegetation. Buffaloes and pigs have been responsible for severe damage to many aquatic habitats in northern Australia, while the grazing by some native animals has had adverse affects where their numbers have been increased by clearing and the provision of water.

Urbanization. Urban development has a profound impact on our flora. Often it merely follows the originally cleared land for primary industries but the provision of ports to service secondary industry has destroyed many areas of coastal heath and swampland. Urbanization and industrial development are thought to have caused the extinction of seven species while more than 20 are endangered, or may become so, by these activities.

Herbicides. Chemicals are used to control unwanted vegetation but may affect species other than the ones aimed at for eradication. Unfortunately in the case of a *Gastrolobium* species and its relatives, these plants are the targets as they are poisonous to stock. In the south-west of Western Australia, the eradication of every single plant is regarded as essential before an area can be grazed by stock as the poison is so lethal. Seven species are now classified as endangered.

Some Endangered Plants.

Just a few words about some more endangered Australian plant species. The Wongan Trigger Plant *Stylidium coroniforme* is represented by two known plants while there is only one population known of the Kangaroo Island Daisy *Achnophora tatei*. The Tangled Grevillea *Grevillea flemuosa* is on the endangered list as it is now known only in an area east of Pingelly, Western Australia. One known site, occurring on a roadside, with 20 specimens of *Gastrolobium appressum*, nurtures a plant which is toxic to stock as discussed above. Continual herbicide treatments of this species have nearly wiped it out, while weed control on road verges has endangered *Daviesia euphorbioides*. Interestingly, lost from sight for 20 years was the

Western Australian underground orchid *Rhizanthella gardneri* of which only the flowers appear above ground.

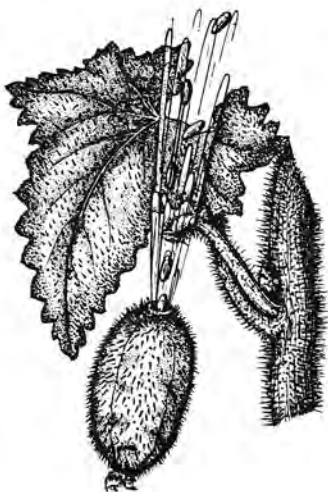
Evolution

You may well ask 'What about the process of evolution?' Extinction is part of this process. It is true that it is estimated that the earth presently carries between 5 and 10 million species of plants and animals which represent only between 2 and 10 per cent of all species that ever lived. How uncaring it would be for us to add to this process, without understanding. The slow and natural process of evolution can be contrasted so starkly with the quick destructive actions of Man. Plant species, whether cherished for pleasure or for material benefit, must be preserved to their fullest but only through knowledge, effort, study, action and co-operation can this be done with any success. We know there are 200 endangered Australian plant species and more than 2000 actually or potentially at risk. We question 'How many will be at risk in the future?' and 'How many additional plant species will be lost forever?'

Acknowledgement is made to *Ecos*, Andrew Bell and CSIRO for information contained in this article much of which in turn was extracted from *Extinct and endangered Australian plants* by J. H. Leigh, R. W. Boden and J. D. Briggs. Melbourne, Macmillan, [In Press].

Dianna McClellan

[A sequel to this article will be published in the next issue explaining ways to conserve species at risk and what Australian botanists and our own Botanic Gardens are doing towards this end.]



The Squirting Cucumber, now extinct in Queensland, has an unusual mechanism to ensure seed dispersal. The fruit builds up high hydrostatic pressure which suddenly ejects a 'cork' at one end, causing the seeds to be squirted out in a jet of liquid.

Illustration reprinted with permission from B.G.M. Jamieson & J.F. Reynolds, *Tropical plant types*, published by Pergamon Press, Oxford, 1967.

THE GARDENS' EDUCATION SERVICE

Since 1980 the Education Department has seconded one teacher to the Royal Botanic Gardens, Melbourne, to facilitate the educational use, especially by teachers and students, of the resources of the Gardens and the National Herbarium.

Last financial year approximately 18,000 students were assisted with excursions to these institutions, and over 300 teachers were given in-service training in the educational use of the Gardens and Herbarium and in botanical and environmental skills and information. Over 200 teachers and students requesting botanical information for lesson or project work were aided by replying to their letter or phone requests. Other work involves preparation of materials, meetings and so on.

My involvement with student excursions may be direct or indirect. I am directly involved with students in providing botanical or environmental 'lessons', often using the collections, displays and equipment in the Education/Display rooms in the Annexe (Astronomer's Residence). These sessions are usually arranged via telephone bookings from teachers; details needed include school, class level and number, date, times, and very importantly, the topic to be covered and what the students will have already covered in school. In this way the excursion content is co-ordinated with their school studies. For example, many, Year 11 Biology classes are booked in for a 'Plant Classification' programme at the Botanic Gardens. Their excursion may be at the beginning, end, or part way through their classroom study of the topic, hence the approach and exact content of their 'lesson' here will vary accordingly.

Teachers are supplied with a Teacher's Guide and students sheets on the topic. The Teacher's Guide contains a map showing specific plants and their locality along a suggested route within the Botanic Gardens. Background notes and suggested student activities are contained within the Teacher's Guide, along with student worksheets for completion during the excursion or back at school.

A range of Teacher's Guides, student's activity sheets, and general information sheets are currently available. These include:-

- Plant Classification and Diversity - senior secondary level
- Plant Diversity - junior to middle secondary level
- Plant Reproduction - middle to senior secondary level
- Trees - senior primary to junior secondary level
- Botanic Gardens Activity Booklet - primary level
- The National Herbarium - secondary level
- Birds in the Botanic Gardens - primary and secondary level

Further Teacher's Guides are prepared on request.

Other materials prepared for teachers include a Plant Diversity Slide Set (33 slides, for loan only) and a booklet called *Trees: a poster study* (notes and activities for 6 readily available tree theme posters).



For groups that I cannot, or need not, be directly involved with during an excursion, the teachers are given planning assistance and supplied with any appropriate materials. Teachers are encouraged to modify the student's sheets to suit their group, and to select relevant parts from the Teacher's materials and present them in a teaching manner to suit their students.



Some possible excursion topics include: plant classification, identification; adaptations; unusual plants; insectivorous plants; diversity; reproduction; native plants, bird studies; historical studies; language studies; art studies.



I would like to thank all the Friends and others who wrote letters to the Education Department, Crown Lands Department, Ministers, etc. regarding the proposed elimination of this secondment position because of budget cuts. I am pleased to report that the position here has been re-instated and I look forward to continuing this environmental education service.

MARION VAN GAMEREN
Education Officer



REPORT ON FEDERATION CONFERENCE

The Australian Federation of Galleries and Museums (AFFGM) is an organisation of over 40 societies, with members in all States and includes galleries, museums, historical societies, botanical gardens and zoos. The Friends have been a member of the Federation for 18 months, AFFGM objectives are to encourage national and international co-operation of the member groups, also to sustain public interest in those groups and to extend their influence in the community. The activities of these various bodies have many areas of overlap and from time to time conferences are held to air problems and share ideas.

At Ravenswood recently - a property near Castlemaine - delegates from South Australia, Tasmania and several Victorian societies met for a day conference. Much helpful discussion took place. Roger Trudgeon from the Ministry of the Arts spoke on a survey he had undertaken on Friends societies in Victoria and among other things pointed out the importance of those societies as a link between the relevant institutions and the public.

As a member of AFFGM, Friends can take advantage of tours arranged by other groups. The National Gallery Society of Victoria is planning a five day tour to Canberra March 29th to April 2nd 1984. It will include the Albury Art Gallery, the Australian National Gallery, the War Museum and the National Botanic Gardens, Canberra. Cost of the tour is \$350 and includes accommodation, breakfast and lunch on two days. Paton Forster, secretary of the National Gallery Society of Victoria will be pleased to supply additional information.

Further afield but useful for Friends who are already planning an overseas trip, is the World Congress of Friends of Museums to be held in Paris, July 2nd - 9th, 1984. Individual members can attend as member visitors and sit in on working sessions if they so desire. In addition there are evening receptions, organised visits to galleries, museums and optional excursions to Normandy, Loire and Cote d'Azur. If further details or information on discount travel are required, write, including a self-addressed, stamped envelope to:

Carol Serventy
8 Reiby Road
Hunters Hill
N.S.W. 2110.

A garden session, exploring the problems of botanical institutions could be included if enough member visitors were interested.

GOLDA ISAAC
Friends' Representative, AFFGM Conference.

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A BEAUTIFUL GIFT...

Special thanks to Prof and Mrs A.G. Shaw for their generous gift of a print of Celia Rosser's watercolour of *Banksia oblongifolia*, from the portfolio edition of A. George, *The Banksias*, Vol. 1., London, Academic Press, 1981.

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Calochilus robertsonii, Purplish Beard Orchid. Reprinted with permission from C. Pugh, *A year of orchids*, published by Richard Griffin, Melbourne, 1983.



BOOK REVIEW

PUGH, Clifton. *A year of Orchids*. Text by Campbell & David Beardsell, drawings by Dailan Pugh, Adriane Strampp & David Beardsell. Pp. 208 (over 100 illustrations including 29 by Clifton Pugh in full colour, map on endpaper). Melbourne, Richard Griffin, 1983. \$75.00. Bound in half vellum with an etching by Clifton Pugh. \$450.00 (limited to 55 numbered and signed copies).

This is a remarkable publication for its beauty and design. It is both a work of art and an authoritative botanical work on the Orchids of the Yarra River system and ranges north and east of Melbourne. It is a book about conservation.

Interestingly, about three years ago, the publisher Richard Griffin visited Clifton Pugh at his property in Dunmoochin and saw pinned to the studio walls Pugh's oil paintings of Australian Orchids. It was then the idea originated of reproducing in book form these fascinating works of art. Pugh started painting Orchids about 15 years ago when he first became interested in and aware of them as an endangered species.

The introductory text is informative in outlining the arrangement of the book's contents but of particular interest is the overall summary of the environment, pollination, conservation, ecology, distribution and habitat of the Orchids. For example mention is made of the beautiful white/mauve flowering form of the vulnerable species *Diuris punctata*.

By 1981 the total wild population of *D. punctata* var. *albo-violacea* was about 30 plants in one threatened colony in a rail enclosure near Sunshine.

It is claimed by the authors that new ground is being broken in the organisation of the book. Pugh's paintings follow the introductory text and are titled 'A year of Orchids', arranged according to flowering time beginning with the Spring. September is the first of five consecutive months over which three-quarters of all our Orchid species flower. The coloured reproductions of the paintings are presented in consecutive months of flowering with each season introduced by appropriately chosen prose such as Spring, 'Shy gold begins to peep through sombre green - the wattle's wedding dress, and Spring is near' On a separate page adjacent to each of Pugh's paintings historical information is included about the survival of the species as well as reference to animal life in the area. For example, on page 62, which describes the Autumn Greenhood, reference is made to the native marsupial, the Brush-tailed Phascogale which together with the Autumn Greenhood is a dweller of the Red Box and Red Stringybark forests of the Diamond and Lower Yarra Valleys.

A case close to home of the effects of rabbits on our native ecosystems is provided -

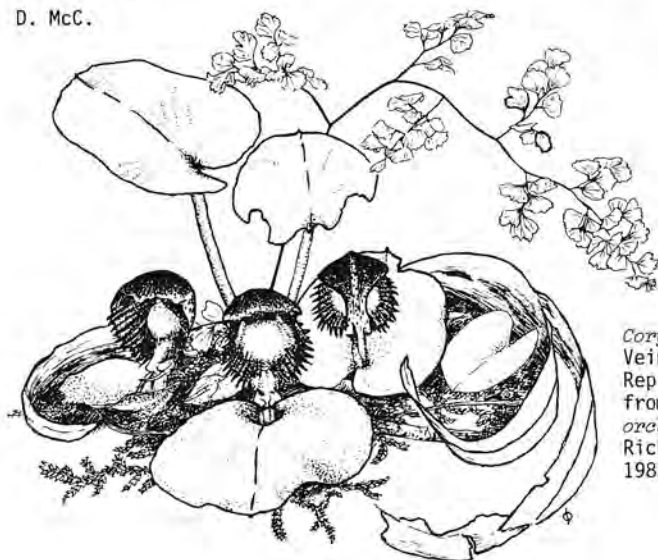
'This colony of Autumn Greenhoods near Dunmoochin, near Hurstbridge, is year after year attacked by rabbits. The leaves and stems appear in mid-autumn, when little other green picking is about; as a result, only a few specimens flower each year. In years when rabbits are particularly troublesome, chicken wire around the colony helps to keep them off'.

'Descriptive text and botanical drawings' is the heading given to the remaining section of the book. Beautiful black and white line drawings by Dailan Pugh, Adriane Strampp and David Beardsell not only depict detail of the Orchids but often include some illustration of the habitat. An example is drawn on page 98 where *Diuris maculata* (Leopard Orchid) is shown with the Narrow-leaf Bitter-pea and Early Nancy, while on page 159 *Caladenia praecox* (Early Caladenia) has been drawn with Red Box (seedling) and Coral Fungi. If you look closely a caterpillar can be seen on the Eucalyptus litter. Included with each illustration are scientific and common names, date and often location of illustration, botanical description which can be understood by the interested layman, distribution, and habitat and abundance.

At the end of the book there is a bibliography. There is also a very useful index to common and scientific names of Orchids and the common names of other illustrated plants, listed in a single sequence. However, checking the index under Coral-pea, Purple, reference is made to page 139 but not to page 82. It would be useful to have animals included in the index, for example the Grass Skink, also on page 82.

Friends will be interested to know that Bruce Muir, an expert on Orchids who recently retired from the Melbourne National Herbarium has written the foreword. He states the book will meet the needs of amateur and professional botanists as well as the layman. This is indeed a beautiful book with wide appeal to anyone botanically and artistically inclined. We are very fortunate in Victoria to have a book produced on our native Orchids so attractively presented and so deeply concerned with their conservation.

D. McC.



Corybas dilatatus,
Veined Helmet Orchid.
Reprinted with permission
from C. Pugh, *A year of
orchids*, published by
Richard Griffin, Melbourne,
1983.

BOOK REVIEW

WATTS, Peter. *Historic gardens of Victoria : a reconnaissance from a report of the National Trust of Australia (Victoria)*. Edited by Margaret Barrett. Pp. 224 (including numerous photos, some colour, and plans). Melbourne Oxford University Press, 1983. \$40.00.

This beautiful book, a tribute to the skills of designer Alison Forbes, presents some of the results of the author's survey to catalogue and assess historic gardens for the National Trust in Victoria.

Sub-titled, a reconnaissance, it is neither a guide book nor a comprehensive history; it is a preliminary survey of important gardens with descriptions and brief histories. Fascinating old photographs and paintings and attractive modern shots of the gardens are an integral part of the book; there are also a number of thumbnail sketches of garden layouts.

Chapters cover Botanic and Public Gardens, Front Gardens, Cottage and Suburban Gardens, Mansions, Country Estates and Mountain Refuges. Some important gardens are omitted because the owners did not give permission for their inclusion.

The first section of the book is an excellent introduction to the history of gardens in Victoria and the book ends with a discussion of the problems of conservation. Peter Watts has a pragmatic approach to garden conservation and includes descriptions of several gardens, such as Bolobek, which have been skilfully remodelled by their present owners.

Detailed descriptions with measurements, plant lists and other minutiae of the architectural historian are not included. These studies are now starting in Victoria as a result of preliminary surveys of the kind carried out by the author.

Friends will be especially interested in the account of the Royal Botanic Gardens which comprises a short traditional description of the landscaping and a balanced account of the personalities involved. There is little on the plants, although *Phoenix canariensis* is singled out for mention. Unfortunately the photograph of the vista across the Central Lake which purports to show conspicuous Date Palms in fact shows *Jubaea*, *Butia*, *Livistona* and *Washingtonia* along with some far from conspicuous *Phoenix* spp. Minor historical errors make one wonder if these are restricted to our Gardens or more widespread in the text. For instance Michael, not Robert, was father of W. R. Guilfoyle, the Nymphaea Lily Lake was excavated 1906-1907 not in 1909 and the famous Committee of Enquiry, which led to Mueller's removal as Director was in 1871 not 1873.

Apart from such criticisms, this is a useful and attractive book which will please the general reader, stimulate research and foster the conservation of historic gardens in Victoria.

PETER LUMLEY
Royal Botanic Gardens