

Botanic Magazine

Volume 6

Official publication of the Friends of the Royal Botanic Gardens, Melbourne Inc.





A 100th birthday party was staged at the Gardens for Mrs Dorothy Jessep, whose husband Alex was Director from 1941 to 1957. She was delighted to see her former home in its newly-renovated state as Gardens House. Mrs Jessep described her period at the Gardens as the happiest time of her life, and confessed to weeping when she left. She still visits the Gardens every year.

Sir David Attenborough after addressing the Friends in August, with Sir Rupert Hamer (left) and Dr Philip Moors.



FRONT COVER:

Rupert Bunny
Australia 1864 - 1947

Black swans, from the series "Familiar scenes in the Botanic Gardens, spring and summer" 1932-33
oil on canvas
51.3 x 58.8cm

Collection: National Gallery of Australia, Canberra

Sir David also saw the heath at RBG Cranbourne in full bloom.



The new seed house funded by the Friends was handed over to the Gardens in September. Lydia Bartlett and Sharon Beaman from the Growing Friends, with Nursery Manager Josie Vaganiance, are elated by its 'high tech' features.



BOTANIC MAGAZINE

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Other Friends groups, some of whose work is represented in the border of the illustration inside back cover, include Activities/Catering, Projects, Publications and Membership. Volunteers also assist in the Herbarium, Friends' Office and Shop.

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STRONG GROWTH FOR GARDENS

by Heather Ironmonger

The quality of the displays and plant care in the Royal Botanic Gardens has risen significantly in the past couple of years, and the scars inflicted by the installation of the watering system have healed. Planning and funds invested in major projects such as the Australian Rainforest Border and the Masterplan are being rewarded with steady progress. While plants routinely pursue their private lives, the latest sensational development concerns a building program designed to entice visitors into the Gardens.

This excitement has been aroused by a government grant of \$2.9 million, to be used to extend the South Yarra site and create new visitor information facilities and a major entry plaza. Construction of the project, given the working title of The Garden Gate, should begin in April 1996.

Opposite the Shrine of Remembrance, a landscaped forecourt incorporating the historic buildings of the Old Melbourne Observatory will lead to an impressive entrance gate. Between the Astronomer's Residence and the Observatory Building, a new structure will accommodate an expanded Gardens Shop, exhibition spaces and visitor information facilities. Part of the Observatory Building will house a cafe.

Further moves will see the Friends occupy Observatory Lodge, opposite the Shrine on Birdwood Avenue, and the new Visitor Programs Branch, which includes education, Guides and program officers, settle into the Astronomer's Residence. A government grant is being sought for the restoration of all the heritage

Renewal of the Perennial Border presented a rare opportunity for a large group of gardeners to work together

buildings, and discussions are continuing with the National Trust concerning a new location for LaTrobe's Cottage.

Constraints on the site, and the feasibility of new uses for the historic buildings there, have been carefully considered by consultants. Buildings which have no heritage value, such as those occupied until recently by Greening Australia, will be removed or demolished.

The more ambitious Gallery of Gardens scheme proposed in 1994 has in effect assumed status as Stage Two for the site, pending further funding. Display gardens and gallery space were among ideas incorporated in this plan.

More than one million people visit the Gardens at South Yarra every year. In a recent major visitor survey commissioned by the Royal Botanic Gardens, 98 per cent declared their visit to the Gardens had 'met or exceeded' their expectations. During the past 18 months the Australian Bureau of Statistics has also been conducting a series of surveys for the Council of Heads of Australian Botanic Gardens. Here are a few of their results from the November 1994 survey which indicated a far greater level of visitation than previously imagined:

Forty-two per cent of men and 45 per cent of women surveyed had visited a botanic garden in Australia in the previous 12 months - significantly more than the comparable total for visitors to all the nation's art galleries and museums. Queenslanders are apparently the keenest visitors, with 53 per cent having visited a botanic garden in the previous year. Victorians and West Australians shared second place, rating at 47 per cent. Women of 65 or older form the largest percentage of female visitors, while the proportion is reversed for males, young men outnumbering their elders.

Dr Philip Moors, Director of the Royal Botanic Gardens, finds the results both impressive and surprising, and wonders why the cultural importance of botanic gardens has gone unrecognised for so long. He believes it is essential for gardens administrators to know who their visitors are and to be aware of their expectations. 'Most critically, loyal visitors can attract municipal, State and national political attention, and bring significant new opportunities to support the future management of gardens', he says. He recognises, from the survey results, the depth of the potential lobby group that visitors represent and is keen to harness it for



Photo by Rosie Laught

the benefit of botanic gardens. The Council of Heads of Australian Botanic Gardens (the Directors of capital city gardens) has taken a step towards increasing political recognition by proposing the formation of a national association to promote the interests of gardens. Just as the Victorian Friends groups have benefited by forming a State association, so gardens Directors believe they will gain strength and influence through national networking. This group would include the provincial gardens.

As the Royal Botanic Gardens prepares to celebrate its 150th anniversary in 1996, the support of the Victorian Government has been demonstrated by its \$4.7 million birthday gift - funding for the South Yarra site already referred to, and \$1.83 million for RBG Cranbourne. The Cranbourne Development Plan launched in February puts Philip Moors in a situation similar to that of William Guilfoyle in the 1870s as he set about creating the marvellous landscape we have in Melbourne



Photo by John Krutop

Long-time Friend Dame Elisabeth Murdoch with the Minister for Conservation and Environment, the Hon. Mark Birrell, at the launch of the Cranbourne Development Plan

today. The Plan provides a long-term strategy, linking the natural bushland of the site with landscaped display gardens, water features, a world-class collection for scientific study, a visitor complex with catering facilities, and a recreation area. A representative patch of each of the five vegetation

communities at Cranbourne has been defined as a Reference Area for purposes of conservation and research.

A key element in this development is the 25-hectare garden of native plants from all over Australia, designed by landscape architects Kevin Taylor, Kate Cullity and Paul Thompson. With a strong emphasis on interpretation, it will depict plant-related aspects of Australian culture, history, science and the arts - for instance, it may give many Australians their first glimpse of the

famous Coolibah tree, or present a collection of bush tucker plants. The garden will begin to take shape later this year when siteworks and initial planting are undertaken. It is scheduled for completion in 2001.

A major native vegetation refurbishment in the South Yarra Gardens - the Australian Rainforest Border - is progressing well and will be formally opened in spring 1996. The only project from the Herald-Sun Revitalisation Appeal still current, the narrow bed running along the Birdwood Avenue boundary is being transformed to represent the eight major rainforest systems of eastern Australia, from Tasmania to Cape York.

Many of the wild-collected species have not previously been grown in Melbourne, so their performance will attract great horticultural interest. Several gardeners have made expeditions to Queensland and northern New South Wales to collect seeds and other plant material to propagate for the border. New paths have been built, and there'll be more planting in spring in the Queensland sub-tropical section. The re-landscaping is now moving towards D Gate (the Cape York end). The sponsors, who choose to remain anonymous, are delighted with the work.

The formulation of the RBG Masterplan - which will guide the



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A native orchid nestles in the fork of a Southern Silver Ash in the Australian Rainforest Border.

management of the Gardens and prepare for the inevitable replacement of over-mature trees in the years ahead - is under way. An important first step has been the development of a Living Collections Policy - one of the first for a botanic garden in Australia. Both existing and new collections will be assessed by the following criteria: Geographical, Ecological, Ornamental, Cultural, Taxonomic/Evolutionary, Conservation and Research Importance. The RBG has some major collections - for example, those from California and New Zealand - and then there are camellias, cactus and such like. Twenty-eight collections have been judged as meeting the criteria of the policy and these will continue to be held and enhanced. Seven others will be given further consideration; others will not be maintained as specific collections, but this is not to imply that they will necessarily be removed. Of course not all plants in the Gardens belong to collections, nor are all collections concentrated in only one location. Individual management plans will be framed for each collection, integrating the skills of botanical, horticultural, design and interpretation staff.

A new landscape plan is being put into effect around the Tea Rooms beside the Ornamental Lake, following the unsatisfactory growth of species established when the new paving was laid down two years ago. Plantings

over spring will enhance the Friends' Shop and the Tea Rooms, producing a lush, more colourful, almost tropical effect, with flowers and foliage.

One of the marvellous features of plants is their ability to be multiplied, so that their addition enhances many gardens. A major propagation effort currently taking place in the RBG Nursery will commemorate the work of that inveterate plant donor, Ferdinand Mueller. During his reign as Director of the Botanic Gardens and Victorian Government Botanist, Mueller distributed tens of thousands of plants to public and private gardens in Victoria. The Royal Botanic Gardens has decided to commemorate the 1996 centenary of the Baron's death by giving plants to Victorian provincial botanic gardens. At this stage, 33 gardens have requested 2200 plants of about 600 different species. Philip Moors sees this as an important project which reaffirms the historical links between the RBG and the regional gardens and he looks forward to visiting many of these gardens next year when the plants are delivered.

That's a very practical gesture to commemorate Australia's greatest 19th century botanist. He is to be honoured in a more academic way, as well, by the award of the first Mueller Fellowship by the RBG. Partly funded by the Department of Conservation and Natural Resources, it will enable a researcher to undertake a four-month project at the National Herbarium in Melbourne which will have an outcome of value to the Royal Botanic Gardens. The Fellow will make use of the collections - living

or preserved - in the institution.

Over the last few years research at the Royal Botanic Gardens has expanded beyond the discovery, naming and classifying of plants to micropropagation, floral development and evolutionary relationships. The range has broadened further with the recent appointment of Liz James as Conservation Geneticist. She will contribute both to classical taxonomic studies and to conservation research. One of her first projects is to look at fragmented plant populations and consider whether they're genetically compromised by their small numbers. She will also apply genetic techniques to an examination of taxonomic relationships of plants. Liz is cementing the RBG's involvement with LaTrobe University; the close association of other Herbarium staff with The University of Melbourne has been strengthened also in the past year. Dr Moors believes gardens have a role in propagation and *ex situ* conservation of endangered species, and the RBG will be involved in an international network. Understanding

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the ecology and botanical requirements, and ensuring genetic diversity, are key factors in any program dealing with endangered species. The RBG may consider establishing a collection of all Victoria's endangered species. 'We will explore at Cranbourne the possibility of *ex situ* conservation, but ultimately it's habitat conservation which is of primary importance, to ensure endangered species survive in the wild', Philip Moors says. 'We are more likely to continue using our skills in the Nursery where, for instance, we've developed new propagation techniques for *Caladenia* orchids, and have germinated and "grown on" an endangered species of eucalypt for the Department of Conservation and Natural Resources.'

Recognition of a non-academic kind - the Guilfoyle Awards for Excellence - was instituted this year at the Gardens.

The first recipients were:

ROD DUNSTAN for his development and delivery of an innovative education service

MARK JENKINS for initiating an ecological management program at RBG Cranbourne

TERRY SMYTH for her dedication to the development and display of the Chinese collection

ROGER SPENCER for writing the first two volumes of the *Horticultural Flora of South-eastern Australia* and for his patient skill in responding to horticultural enquiries

JENNY YUNGHANNS for redeveloping and refurbishing the Gardens Shop as a viable commercial outlet

THE EQUAL EMPLOYMENT OPPORTUNITY COMMITTEE (David Cash, Helen Dobson, Leia Giannakopoulos, Izabella Meraviglia-Crivelli and Patricia Quinn) for their development and delivery of equal employment policies and practices for the RBG.

Since the Gardens achieved independence with its Board and a new Director, much administrative reorganisation has occurred. The last of the divisional reviews was completed earlier this year, with a new expanded structure developed for the Public Programs and Development Division. The Director says that the growth in numbers of staff with skills in fundraising, business development and marketing provides additional much-needed revenue which will assist all Divisions.

The Government is, of course, the main income provider for the Gardens (\$4.3 million last financial year). But Philip Moors takes pride in reporting that the Gardens administration will contribute \$600,000 to its operational budget in 1995-96. 'A lot of the things we do are made possible by the success of the Gardens Shop, functions, theatre in the Gardens and so on', he explains. 'In 1992-93 we relied entirely on the

government; in three years we have moved from zero to raising \$600,000 in a total budget of \$5 million.'

In addition to sponsorship gained for specific projects, grants facilitate short term staff appointments. In the highly competitive arena of research funding, Herbarium staff did spectacularly well in attracting external grants totalling \$185,000 in the last financial year. Dr Don Foreman has achieved another honour for the RBG, gaining selection by the Australian Biological Resources Study to serve as the Australian Botanical Liaison Officer at the Royal Botanic Gardens at Kew for 12 months from September 1996.

Visitors who have lost their bearings in the Gardens (and isn't that almost everyone!) will welcome the introduction of a co-ordinated sign system. A vast array of information boards, directional signs and plant labels will be put in place progressively from spring 1995. The design and installation of the system was made possible by a major grant of \$200,000 from the Victorian Government via the Community Support Fund and additional sponsorship from Pacific Dunlop.

Recent amendments to the Royal Botanic Gardens Act 1991 enable RBG staff to offer professional consultancy services on botany, horticulture, arboriculture etc. An interesting three-year contract involves staff in collecting fresh plant material for the Australian pharmaceutical company AMRAD. AMRAD screens both cultivated species from the Gardens and native Victorian flora for their potential use in pharmaceuticals.

Another important collaboration, between Esso Australia and the Gardens, sees a Gippsland rainforest being planted in the atrium of the company's new headquarters by the Yarra on Southbank. Tree ferns salvaged from forestry operations in East Gippsland are among plants ready to be established there this spring.

Two proposed road construction projects have caused the Board some

Refurbishment of the grounds surrounding Gardens House involved the removal of dense bamboo.



Photo by Rosie Laught

concern. One matter is now resolved; the Domain Tunnel route will not pass under the Gardens at all. However, its line of construction will pass near (but well below) G Gate; some disruption is inevitable along Alexandra Avenue when construction is in progress. As to the Ballarto Road proposal at Cranbourne, a decision is still some way off. The Environmental Effects Statement is well under way, and the five proposed routes have been reduced to three. A published report with recommendations, and a public hearing process, will constitute the next stages.

To end on a very positive note, the education service continues to flourish. In Term 4 the attachment of a second teacher will allow for additional courses. Student participation has increased from about 2500 in 1992 to more than 20,000 in 1995. The service caters for young people from pre-school to tertiary level (mainly TAFE), with the highest proportion being students in primary grades. The RBG, the CSIRO and the Museum of Victoria are in the third year of a co-operative Mentor Program for Year 10 students. There are tutorials and lectures in the natural sciences for 10 weeks, followed by a placement with a scientist in an institution for 6-8 weeks. The education service also participates in the Interactive Satellite Learning Network, a new information program which is transmitted via satellite to schools across Victoria.

Of course, numbers are not the only way to judge the success of this service; the wide range of programs and holiday activities draws great praise and appreciation from students and teachers alike. It's common for enthusiastic children to bring their parents to the Gardens, to pass on information about plants that has fascinated them on a school visit.

Three new education programs will be introduced in the near future, funded by the William Buckland Foundation (which is administered by the ANZ Trustees). They address the broad issues of biodiversity and all have an action component.

Photo by John Krutop



Last summer, 70,000 people came to the Gardens to enjoy plays, films and concerts. The Gardens provide a wonderful setting for these events, which are a key element in the variety of experiences offered to visitors. The Secret Garden was one of several popular shows staged in the Gardens last summer.

- **Into the Rainforest** will make use of the Gardens' developing Australian Rainforest Border to interpret the deteriorating situation of rainforests worldwide.
- **Plants and Animals Living Together** will explore their fascinating relationship, especially looking at their interaction in the Gardens.
- **Plants on the Brink** will study endangered species, and consider what individuals, as well as institutions such as botanic gardens, can do to conserve them.

These programs will be additional to the existing activities: the Aboriginal Resources Trail, Plants that Dinosaurs Ate, Art in the Gardens, Get Your Garden Going, the Plant Biology Resources Program for senior secondary students, the very popular Introduction to the Gardens for Prep. to Grade 2 children, and the Early Childhood Program

for pre-schoolers. The holiday activities run by the Gardens for the first time last summer were so popular that two weeks will extend to five this summer. Clare the Fairy will be back with a new bunch of friends, and some educational activities are likely to be staged in association with Glenn Elston's production of *The Secret Garden*.

The Astronomer's Residence is earmarked for the education service when the Observatory Site is transformed, but in the medium term the Eastern Lodge will be maintained for education activities as well.

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REMEMBERING

An Earlier National Herbarium

by Darren Watson

Darren Watson works at the Australian Archives and undertook an Oral History Project for the Royal Botanic Gardens as part of an MA degree in Public History at Monash University.



James Tovey

In the months leading up to August 1935 one of the greatest botanical collections in the world was on the move, crossing Birdwood Avenue. The 1,250,000 specimens of the National Herbarium were on their way to their new abode, taking in tow 20,000 library books and the two botanists who made up the total staff of the institution.

While moving to the recently-completed, double-storey structure across the way these botanists, James Audas and Patrick Morris, would surely have cast their eyes and thoughts back to the home they were leaving. It was common knowledge that the elderly building would not continue to stand for long; work on the new Shrine of Remembrance was under way and the old National Herbarium was to be sacrificed to it, expunged without a trace. Between them, Audas and Morris had spent 60 years in that cramped and crumbling building. This had been the cradle of botany in Victoria, a keystone in the soured dreams of Baron Ferdinand von Mueller for a

ELIZABETH RENOUF, whose recollections enrich this article, was the younger daughter of James Tovey, Chief Assistant at the National Herbarium. An article in *The Age* in May 1994 about the Gardens' Oral History project elicited a response from her niece, Pat Sutton, and this previously unknown surviving link with the Herbarium's past proved to be a rich source of information. At the age of 92, Elizabeth Renouf sent two typewritten letters to the Gardens, describing the institution as being part of her growing-up years until her early twenties.

James Tovey dedicated his life to botany. He had a complete knowledge of Australian plants and, through Herbarium specimens, of the wider world of plants. He was the last person trained by Mueller - training that stood by him during the 33 years he spent at the Herbarium. Elizabeth Renouf recalls that her father was considered unsuitable for the position of Government Botanist, not having a degree. He did not teach at the University, but often led students on excursions; vacant ground with plentiful native flora on what is now the Old Cheltenham Cemetery was a favourite site for lessons. He also took students to the Grampians, she remembers.

Eventually, Tovey was forced by illness to leave the Herbarium. Elizabeth recalls that as a very tough time for her parents, with three to be supported in the family, and no welfare of any sort in those days. After two years, during which the Herbarium had been unable to find a replacement for Tovey, he was invited to return. He was happy to do so, even though the wages were low and the conditions poor. Although paralysed, he still had a wonderfully clear brain and a remarkable memory of the placement of specimens and folios in the Herbarium. Elizabeth's older sister Anastasia wheeled her father to his duties every day, and did any physical work necessary for him. The authorities never paid her. 'Father rather looked upon it that she was his assistant and he was responsible for her help', Elizabeth said. Both daughters sometimes helped Tovey by typing documents for him, without payment. He spent four years at the Herbarium under these difficult circumstances, working until the Christmas break in 1922. Just days later, on 30 December, he died.

centre of botanical knowledge second to no other in the world. Instead it came to represent official neglect and the struggle of a dedicated few against perceived irrelevance. Its passing was the end of an era, but the beginning of a brighter one.

The building's foundations had been laid in the Domain (between the present National Herbarium building and the Shrine) late in 1859, the work being tendered to Henry Jacobs

for the price of £875.¹ It was to be the repository of the herbarium that the then Dr Mueller, Government Botanist and Director of the Botanic and Zoological Gardens, had commenced collecting on behalf of the Government some six years previously. In this stately little building his collection would 'be at all times accessible to the public and hereafter contribute, I trust, to diffuse more and more knowledge of our



Mueller's Herbarium photographed about 1910. The picket fence was removed in 1923.

vegetable world and excite lovers of natural science to assist in my investigations'.²

By mid-January 1861 Mueller was able to report that 'the first wing of a building destined for a Botanical Museum was completed in the early part of the past year, but became only within the last months sufficiently dry to serve as a receptacle for our daily-augmenting collections of dried plants, woods, carpological specimens and technical vegetable productions now transferred thither'.³ If this 'first wing' had been completed relatively promptly, the remaining wings envisaged by Mueller were a long time coming. It was a single-roomed building and, although it received enough storage cupboards to hold up to 160,000 botanical specimens, it was soon to prove inadequate for holding the dedicated doctor's fast-growing herbarium and collection of botanic exhibits. He made requests for the extensions he had been counting on in his annual reports of 1862, 1865, 1869 and 1874, the last of these being made under the strain of recently having lost his post, and hence office accommodation, in the adjacent Botanic Gardens. He explained the parlous state of his now skeletal department, seemingly in the belief that a sense of shame and pity would combine to elicit a government response: 'the only building space remaining at my disposal for the whole departmental work in every branch being the Museum room, which is overcrowded by the normal

collections and to which no building additions have been made during the last sixteen years, not withstanding repeated solicitations'.⁴ Nine years after this request an iron annexe was added.

The building Elizabeth Renouf (née Tovey) recalls from around the time of the First World War was essentially the same as it had been some 30 years before (and, indeed, as it was to remain until the eve of its destruction). She and her sister Anastasia worked there on occasion with their father, Assistant Botanist James Tovey, and through her memories one can still tour the building. A picket fence, usually painted white or beige, encircled the building together with its lawn and garden beds. At the front of the building's original western wing was a portico of classical design. Beyond double doors one would pass into a large rectangular room - the main workroom - with lofty windows set into the left-hand and far wall through which the late afternoon sun would stream. Lining all the walls were tall specimen cupboards, their wood polished to a dark brown hue, while commanding the centre of the room was a very large oblong work table. About half-way down the right-hand wall was a door that opened onto a passage, which in turn led to another rectangular room. This was the iron annexe of 1883, utilised as a lunch room and ancillary workroom and forming the eastern wing of the building. Remotely on display by the doorway of this far

room was a wooden box, about three feet in height, with a large label proclaiming it to be the receptacle within which the bones of Burke and Wills were returned to Melbourne and recalling the late Baron's connection with that ill-starred expedition. Along the left of the passage were two doors opening onto twin rooms, one a library and office with walls hidden by crowded botanical volumes, the second containing more of the tall specimen cupboards. Each was illuminated by a window giving onto Birdwood Avenue.⁵ A photograph dating from the early 1930s shows much of the exterior of the building fittingly swathed in a garment of green ivy.

Elizabeth's father had a more intimate association with the building than most. Having moved from the country in 1890 at the age of 16 to take up a position as a junior assistant under the Baron, he was permitted by the latter to live in the lunch room in the eastern wing, more than likely with accompanying caretaker duties. No doubt intended as a short-term arrangement, James Tovey's residence was to last until he was married quite a few years later. What must have been a singularly lonely residence in this musty old building surrounded by the then only half-tamed Domain was mitigated to some extent by the friendship he developed with James Mannix, an astronomer who lived in the Observatory just across from the Herbarium. The two would remain lifelong friends.⁶

Of course during the day there was no shortage of callers at Tovey's home and workplace. James Audas, in a letter dated January 1919, catalogued an assortment of regular visitors in search of botanical knowledge, not unlike the cross-section of people frequenting the Herbarium's corridors today. They included members of the public calling with specimens for identification, journalists, Botanic Gardens staff, Agricultural Department officers and seedsmen.⁷ One who visited more frequently than most was Alfred Tadgell, a renowned amateur botanist. In 1933 he utilised his acquaintance with the

then Premier, Sir Stanley Argyle, to cultivate official favour for devoting £15,000 of Sir Macpherson Robertson's Centennial gift to the State to the construction of a new National Herbarium building.

It was not before time, all parties agreeing that the old building had had its day. In an article announcing the decision Botanic Gardens Director and Government Botanist Frederick Rae outlined the less-than-perfect conditions under which the botanists were working. Most of the specimens were now lodged in the 1883 iron annexe where the receptacles, large tin boxes, were stacked to the roof. Many specimens could only be recovered by mounting a long ladder and almost literally crawling into the boxes. Valuable copies of unbound scientific periodicals, also stored there, were reportedly being slowly destroyed by the sweating of the corrugated iron. In addition the building was considered to be a fire hazard.

The foundation stone of the new building was laid on 27 April 1934, and by 1936 the old National Herbarium, Mueller's Botanical Museum, was only a memory. A public toilet is now situated close to the site where it once stood.

¹ *Victorian Government Gazette* 1859 page 2695

² "First General Report of the Government Botanist on the vegetation of the Colony" in *Victoria - Parliamentary Papers - Votes and Proceedings of the Legislative Council* 1853 1 (A. No. 26a & b): 1-22

³ "Annual Report of the Government Botanist and Director of the Botanic and Zoological Garden" in *Victoria - Parliamentary Papers - Votes and Proceedings of the Legislative Assembly* 1860-1 3 (No.19) 1-18

⁴ "Report of the Government Botanist for the year ending 30th June 1874" in *Victoria - Parliamentary Papers - Votes and Proceedings of the Legislative Assembly* 1874 3 (No. 70): 1-4.

⁵ Mrs Elizabeth Renouf correspondence 12/8/1994 and 7/11/1994

⁶ Mrs Elizabeth Renouf 7/11/1994

⁷ VPRS 3992, Unit 2096, Item A3935

⁸ Mr Douglas Rae correspondence 23/3/1995

Australian National Herbarium

Australia has a new herbarium - the Australian National Herbarium in Canberra - formed by the merging of plant specimen collections held by the CSIRO and the Australian National Botanic Gardens.

In a new building, the Herbarium houses nearly one million specimens, including 65,000 eucalypt specimens, and Australia's largest collection of more than 150,000 mosses, lichens and liverworts. Its oldest specimens include some collected by Sir Joseph Banks along Australia's east coast in 1770. A specialist tropical rainforest collection of about 100,000 specimens is housed in north Queensland at CSIRO's Atherton laboratory.

The Herbarium's research program has specific relevance to contemporary environmental policy. It will have a major role in maintaining plant biodiversity and in safeguarding rare and threatened species. Management of forests to ensure a sustainable timber industry, and development of crop strains to resist pests, disease and drought, are examples of practical studies being undertaken at the Herbarium. The new wing of the Australian National Herbarium provides modern facilities such as well equipped systematics and molecular biology laboratories which enable the researchers to pursue diverse research projects.

While our Melbourne Herbarium is famous for its coverage of early Australian collections, particularly those associated with Mueller, the Australian National Herbarium has a comprehensive coverage of northern Australia and also extensive collections from New Guinea. The Australian National Herbarium has a more national focus reflected in its collections than that of the Melbourne Herbarium which, by its very nature, now concentrates on Victoria.

Inquiries, and access to the Canberra Herbarium's plant identification service, are handled through the visitor information centre at the Botanic Gardens, tel (06) 250 9450 or through the Australian National Herbarium itself, by contacting Andrew Lyne on (06) 246 5508.



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Rose Pavilion Blooming Again

by Ellen Mercer

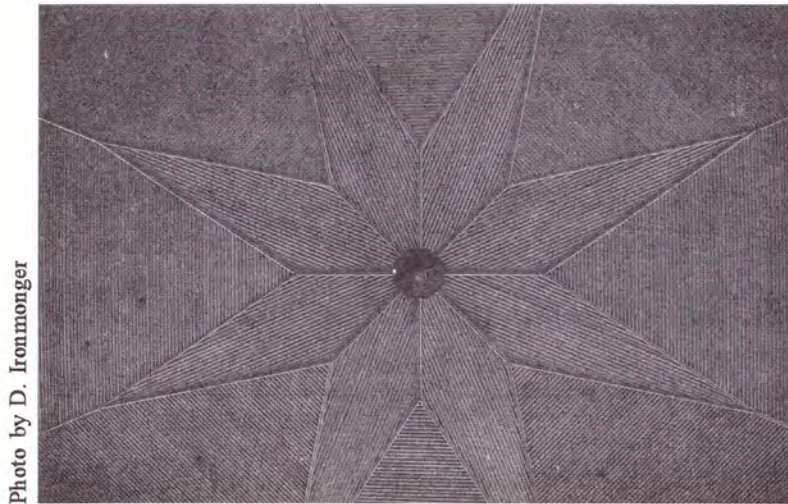


Photo by D. Ironmonger

Detail of ceiling, Rose Pavilion



Near the end of last century a new bandstand, known as the Rose Rest House, was built on the edge of the Hopetoun Lawn. This building is one of the few in the

Gardens surviving from the late 1890s and early 1900s, after the Yarra River had been straightened and after William Guilfoyle established the lake in its present form. Nearly 100 years later, the Rose Pavilion has been restored as closely as possible to the original structure. The name has changed slightly over the years, and the view towards the lake is now hidden by extra growth.

In 1993 a detailed report on the history and structure of the Rose Pavilion was commissioned by the Gardens from conservation architects Nigel Lewis Richard Aitken Pty Ltd. Restoration was well advanced when a classic case of 'serendipity' changed the course of the work. Richard Aitken and his wife were looking through a family album when a faded photograph of her grandmother and aunts, taken about 1940, filled Richard with a delicious shock of

recognition. He immediately realised from the background that they were sitting in the Rose Pavilion. This and additional photos in the album provided hitherto missing evidence of the wooden and scoria panelling. (The scoria is not much admired these days, but authenticity provided the rationale for reproducing it!)

The project was being funded to the tune of \$65,000 by 12 corporate associates of Pacific Dunlop Limited to celebrate the company's centenary. Restoration plans were re-assessed, and the Friends of the RBG donated the additional \$16,000 needed to re-create the original interior design revealed in the photographs.

The 'new' Rose Pavilion restored to its 'old' glory was re-opened on 26 October 1994. The roof, with golden orb

The 1943 photograph by Gordon Binns of his wife and daughters that provided the clue to the Rose Pavilion's wooden panelling.



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Photo courtesy Greg Binns





Print (not previously published), from a glass negative, of the Rose Pavilion, photographed by Gabriel Knight about 1900.

From La Trobe Collection, State Library of Victoria.

disappeared behind a giant Bunya Pine (*A. bidwillii*). From the path opposite the entrance, the flat dome of the Bunya Pine looks like a variation of the curved roof of the Rose Pavilion.

An interesting photograph was discovered by Janet Walsh in the course of researching the history of the Plant Craft Cottage. A 'Help Needed' plea in *The Age* yielded a photo from Mrs Katie Sandiford showing her husband, Bert Sandiford, working on the roof of the Rose Pavilion in 1926, when the building was being renovated.

and spike at the apex, is a striking reminder of the Gardens' 19th century origins. Its new lapped boards will weather to a natural grey to give a rustic effect. (In the 1970s, the original wooden roof shingles had been replaced with metal decking.)

The interior hoop pine panelling is exquisite, from the petal pattern of the ceiling to the diamond panels on the back of the seating. The finely corrugated panels resemble bamboo in colour and shape, complementing the oriental sweep of the roof. The octagonal design of the ceiling is repeated on the concrete floor, with eight sections radiating from the central orb.

Bandstands were popular features of public gardens in Australia from the 1850s, following the traditions of Europe and Britain. Mueller in 1858 described the Melbourne Botanic Gardens as 'a place of healthful and instructive recreation' in which music played a part. There were several bandstands in use before the Rose Pavilion was constructed. Pescott refers to one in the south-eastern section of the Gardens which was for some years the venue for the band of the 40th Regiment. 'Their musical programme contributed a great deal to the popularity of the Gardens', he wrote.

An illustration of a summer moonlight concert shows the band rotunda and trees brightly illuminated - bud lighting 1875 style. Guilfoyle recorded his pleasure at the audience's orderly conduct - there was 'not the slightest damage, even to the displacement of a label'.

The earliest photo of the RBG Rose Pavilion is dated 30 October 1897, and was taken on the occasion of the Police Band recital on Hospital Sunday. Young men in sailor suits and Breton straw hats look carefree compared to the older men in narrow suits and bowler hats. Ladies are resplendent in long dresses with billowing mutton-chop sleeves. Huge flat straw hats are decorated with masses of artificial flowers.

A 1908 photo shows the Rose Pavilion with a rather ragged Hoop Pine (*Araucaria cunninghamii*) in the background. The Hoop Pine is still there, but has almost

The Rose Pavilion was carefully sited by Guilfoyle to overlook the Ornamental Lake and to achieve the best acoustics. The flat wooden ceiling was also designed to enhance the sound. However, although band performances were popular with the general public, the Directors were not so enthusiastic. Guilfoyle's 1908 Guidebook states '...The building (Rose Rest House) is allowed to be used on Hospital Sunday only, for a Band performance in aid of the Hospital Charities'.

Cronin in his annual report, 1913-14, is in agreement. 'Band performances on several occasions, may need reduction in frequency to protect lawns, plants, etc.'

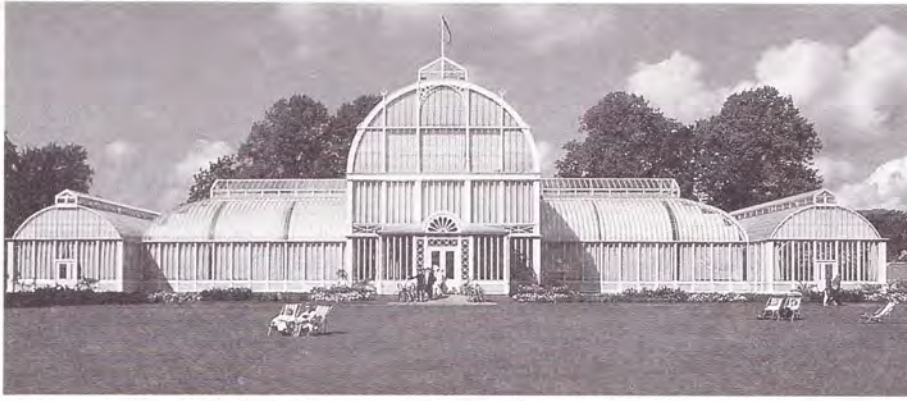
A 1944 booklet describes a concert by the Railway Workshop Band which attracted nearly 5000 people on the Hopetoun Lawn. Free concerts performed by the Melbourne Symphony Orchestra in 1930-31 drew complaints about damage to the Gardens, as did the 'Music for the People' attended annually by up to 120,000. The opening of the Myer Music Bowl in the Domain in 1959 relieved the Gardens of this massive crowd pressure, although of course concerts on a smaller scale continue to be held.

Records of the original roses growing around the Pavilion have been lost. An early reference in Guilfoyle's 1908 Guidebook states '...Rose Rest House...has a collection of pillar roses planted and trained on and around the various upright supports...'. Five of the eight Alister Clark roses chosen for the restored Pavilion are 'pillar roses' - roses that adapt to the shape of their support. Colours range from lilac pink to rich rose and red, with the apricot yellow blooms of 'Mrs Hugh Dettman' providing a contrast.

The perfume of flowering roses will add the last nostalgic touch to the restoration of the Rose Pavilion.

Reference:

Pescott, RTM. *The Royal Botanic Gardens Melbourne, a history from 1845 to 1970*. Oxford University Press 1982.



The 1878 Palm House in Göteborg Botanical Garden, Sweden

The Role of Botanic Gardens in the Community

by Dr Brian Morley

Dr Brian Morley has been Director of the Botanic Garden and State Herbarium in Adelaide since 1980. He served as Secretary-General of the International Association of Botanic Gardens between 1984 and 1994, during which time he visited more than 50 botanic gardens around the world.

He's had other international links as well: his Ph.D. study was undertaken in Jamaica at the University of the West Indies; early in his career he worked as a taxonomist at the National Botanic Gardens in Dublin, and he served as Scientific Adviser at the US National Tropical Botanic Gardens in Hawaii, 1989-93.

As we face the daily domestic challenges in each of our own botanic gardens, be they neighbourhood, regional or State, it is important to retain a sense of perspective on how our work is helping to operate a global network of botanic gardens. There is so much that we can learn from each other.

The Victorian Friends' Association is an impressive organisation. The importance of the work of Friends in botanic gardens cannot be over-estimated. Indeed, I believe that importance will continue to grow both in Australia and overseas. Community involvement and understanding of the role of Australian botanic gardens has been greatly enhanced by the formation of Friends organisations. Improved community awareness indirectly channels to government an understanding of the needs of botanic gardens, and also ensures that botanic garden administrations

remain firmly in touch with community needs and expectations.

Heads of botanic gardens in Australia have currently engaged the Australian Bureau of Statistics to analyse the mix of people visiting their gardens. We find about 95 per cent are recreational visits; only about 5 per cent are for educational purposes, and that challenges the argument that these gardens are largely educational institutions. Our task is to increase the amount of educational entertainment that our botanic gardens can provide for the community.

An estimated 100 million people are attracted annually to the 1600 botanic gardens around the world. From the point of view of administrators, the potential captive educational audience is immense; it's our duty as administrators and as Friends of Botanic Gardens to capitalise on that.

The level of support by an increasingly urbanised society is a factor which educators and governments will need to consider as the urgency for implementation of a World Conservation Strategy continues to grow. The importance for botanic gardens to record visitor numbers cannot be over-estimated.

The International Association of Botanic Gardens has existed since 1954 and has the objective of improving international dialogue between botanic gardens and arboreta as institutions. Only with close co-operation of this sort is it possible to co-ordinate the exchange of information required in helping to promote and improve botanic gardens and allied organisations as community resources. The botanic gardens of the industrialised nations of the world have a role to play in helping the work of sister institutions in less developed countries, in the tropics and subtropics, which is

where two thirds of all plant species occur.

I continue to be surprised at people's differing perceptions of the role of botanic gardens. The best botanic gardens are an amalgam of art and science and this immediately blurs traditional classification of these institutions. They need to bring education, science and recreation together in a balance which is not necessarily fixed, but in which all three disciplines are realised. A Coalbrookdale fountain is one of the many objets d'art that we have restored in the Adelaide Botanic Garden and similarly, the memorial to Allan Cunningham in the Royal Botanic Gardens, Sydney, brings together a beautiful setting and a tribute to a scientist of great standing.

There is great love, great fervour, dedication and devotion throughout Japanese botanic gardens for the cultivation not only of their flora, but of flowers from other parts of the world. Our colleagues in Japan are

doing more to help the work of developing nations than anyone else at this time. There are about 60 botanic gardens in Japan and they are vitally interested in what we are doing in the West. There is a great deal that we in the West can learn from Japan. In the Tokyo Botanical Gardens you can find the most informal and charming of refreshment facilities; they have a decorative quality of their own and there are no hoardings or other eyesores. And how does Tokyo get rid of its thousands and thousands of tonnes of rubbish? It incinerates city rubbish, and the heat generated 'drives' the conservatory, an interpretive facility on tropical plants.

Botanic gardens reflect the cultural character of the society they serve; they are a sort of cultural barometer. Hawaiian, Jamaican, Australian and Irish botanic gardens all differ, yet all had similar colonial origins.

The major botanic gardens in Australia, with the exceptions of

Canberra and Perth, were developed in colonial times and served largely as acclimatisation centres for introduced economic and ornamental plants. They were also centres in which the native flora of the colony could be documented and which provided for recreation and education. Their administrative development and physical appearance, particularly Adelaide, Melbourne and Sydney, owe much to the European tradition and gardens with associated herbaria such as those at Edinburgh and Kew.

The scarcity of financial and staffing resources available to implement new initiatives has sometimes been attributed to lack of understanding by the bureaucrats or politicians. I suggest that is not strictly true. It does not explain major investment and expansion in botanic gardens such as Missouri, Hamburg, Frankfurt, Kew, Edinburgh, Adelaide and Sydney. Professor Kai Larsen, past president of the International Association of Botanic Gardens,

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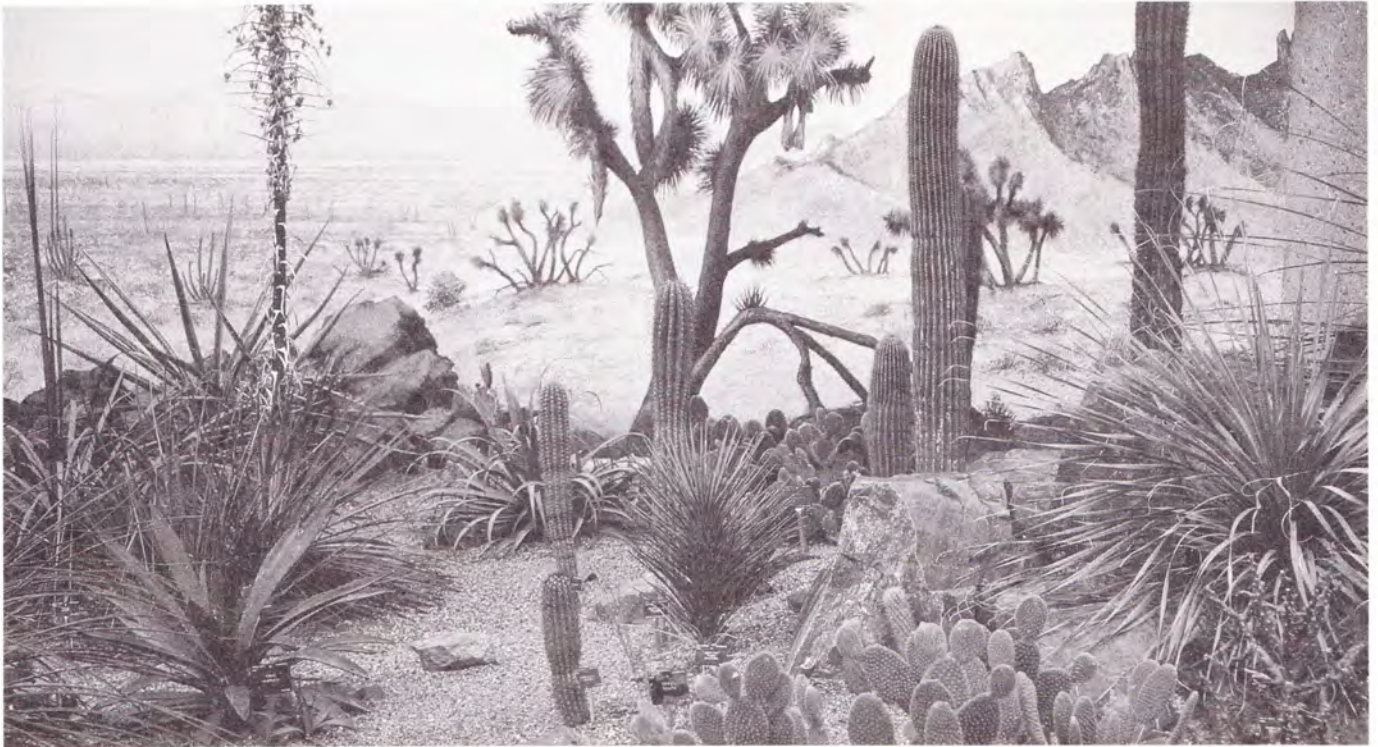
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Art and nature combine in a dramatic arid zone display in the Princess of Wales Conservatory, Kew Gardens.

observed "...it is often in the power of a garden director to prevent disasters or to create progress for an institution if the right steps are chosen, and there are many ways to do this." He stressed the need to improve student and public education facilities, maintain an active scientific program, seek parallel funding arrangements with industry over joint projects and promote the conservation of plant resources.

In Australia there is good evidence to show that State and federal governments are already aware of the

long term community value of botanic gardens and associated herbaria. For instance, in South Australia a \$7.3 million tropical conservatory was built as a Bicentennial Project for the Botanic Garden of Adelaide and an adjacent 5.8ha industrial site is being progressively given over to reclamation by the gardens. This exciting project, costing about \$3 million, will come to fruition in 1998 as an extension to the Adelaide Botanic Garden. It is the sort of investment and vote of confidence in

tourism as well as botanic gardens that administrators and Friends must promote. At Port Augusta steps have been taken by the community to create the Arid Land Botanic Garden. It was the community which pressed for the creation of Adelaide Botanic Garden 139 years ago, Mount Lofty 40 years ago and Wittunga Botanic Gardens 20 years ago.

It would be unwise to experience undue euphoria at the multimillion dollar investments being made in Australian botanic gardens and herbaria. It is a start for which we should be grateful, but there is still a long way to go; furthermore, many of the investments being made are not for new initiatives, but for replacement of older existing facilities.

Since the 1950s the role of botanic gardens in Europe, North America and Australasia has undergone a radical change which is still in progress. The importance of conservation studies to the rapidly growing numbers of threatened or endangered plant species throughout the world has led to botanic gardens becoming the centres in which the problem is studied. There has been a re-awakening of interest in native flora for horticulture and in

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PHOTOGRAPH: GRAHAM PIZZEY

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Australia, for the first time since George Bentham wrote his *Flora Australiense* as an identification manual in the 1870s, a new national flora is being written. (It will not be finished for about another 30 years.) Botanic gardens are now expected by the public to provide native plant displays featuring species from known wild localities, and associated herbaria are expected to provide an unprecedentedly high output of quality floristic, review and revisional studies on native plants.

In Australia the Royal Australian Institute of Parks and Recreation acknowledged in 1984 the inadequacy in facilities for displaying and conserving native plant collections. The main recommendations of their national report were a request for corrective action by State and federal governments; the establishment of a National Core Network of 39 botanic gardens and arboreta; the establishment of a national co-ordinating committee with a Canberra-based Secretariat; and the expenditure of the necessary capital works funds. The Australian Network of Plant Conservation based in Canberra now co-ordinates work on conservation of our native flora.

Networks of regional botanic gardens in arid land and wet tropical areas of Australia have been created.

Since 1980 a Council of Heads of Australian Botanic Gardens has met annually to help address and co-ordinate broader issues facing botanic gardens.

Photo by Richard Humphrys



The Bicentennial Conservatory in the Adelaide Botanic Garden

It has been stated that the Australian flora, comprising more than 20,000 species, contains 2,200 which are at varying degrees of risk, with 203 species considered endangered. As a continent we have a very diverse flora and it is simply not possible for the major botanic gardens to display and feature the regional groupings of plants that we find throughout Australia. This is where regional gardens have a critically important role to play.

The Botanic Gardens Conservation International based at Kew and Australian Network for Plant Conservation based at Canberra are attempting to quantify the problem of threatened species. Surveys are in progress documenting those endangered species from different parts of the world which are already cultivated in botanic gardens. Many developing nations have, or are creating, botanic gardens which are

becoming crucial to the success of plant species conservation, regional crop plant conservation, or are providing teaching centres for landcare activity.

It has been estimated that the major 800 botanic gardens of the world occupy a potential 100,000 hectares in which plants can be grown outdoors, and 2,500 glasshouses with a total area of about 100 hectares in which tropical endangered plant material can be grown. Thus the potential of available growing space is good provided the duplication of collections can be avoided. In botanic gardens in Australia and overseas there is immense duplication. We are all growing the same sorts of thing. What we really need to do is to co-operate to maximise the advantage of the available growing space.

The changes in the Australian environment, and in particular, those

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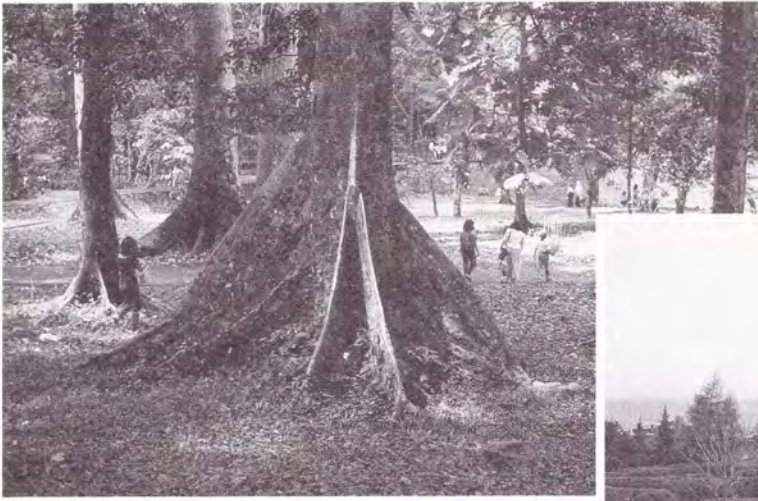
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Buttress roots of trees growing in Kebun Raya Bogor, Indonesia (Bogor Botanic Gardens)



Ringve Botanical Garden near Trondheim, Norway - the most northerly botanical garden in the world. Hedges separate and provide shelter for plants organised according to geography and classification

changes which are such a threat to tropical rainforest and arid land ecosystems, are not unique. We as a nation share problems similar to those of our neighbours, for example, in Malaysia and further afield in Africa or South America.

We know that there are some 1,600 botanic gardens in the world, the vast majority of which are situated in the north temperate zone, in Western Europe, North America, the former Soviet Union (94) and to a lesser extent the Far East. However, the number of arid land botanic gardens can be counted on the fingers of one hand. Only two hands are needed to list the major tropical botanic gardens of the world. Waimea Arboretum in Hawaii has some stunning displays of Pacific Island plant groups and is a world leader amongst tropical botanic gardens. In Java, at Bogor, you can visit the oldest and most spectacular tropical botanic garden in the world. For historical reasons, botanic gardens and their research resources are situated where they are now least effective in helping resolve problems in wet tropics and arid land ecosystems. With the demise of unfashionable taxonomic botany in most university botany departments, botanic gardens with research herbaria now comprise the main centres where floristic manuals can

be written and flora surveys can be conducted. Taxonomy is a fundamental science and this tendency not to teach it is creating profound problems.

The flora of the Malay Peninsula is reasonably well known thanks to the work of British colonial botanists. Since 1963, there has been rapid loss of natural forests through logging. There is no flora of Borneo, and the knowledge of that of Sabah and Sarawak is very imperfect. There is only one botanic garden and aboretum in Malaysia. As there are less than 10 active plant taxonomists in Malaysia, the prospects of improving the knowledge of the flora are poor.

Although there is still pioneer survey work to be done here on the Australian flora, particularly in our tropics, the relationship of our flora with that of Papua New Guinea makes it pertinent to ask why there is no significant Australian overseas aid programme of floristic survey being undertaken. Australian botanical endeavour in the South West Pacific and Indonesia is even poorer. In fact the Edinburgh Botanic Garden has probably done more as a single institution than Australia as a whole throughout the Pacific.

Only in southern Africa is there an acceptable knowledge of the flora of

the continent - the rich floras of East and Central Africa are all in ecological crisis.

We need to look at the link between botanic gardens and national parks. The amount of protection offered to the habitat in certain national park systems in some tropical countries is token, and in some instances compromised by local corruption. Accordingly, the area and diversity of habitat dedicated to national parks is only as good as the standard of maintenance employed and the standard of the associated knowledge of the biota being managed. In many tropical countries there are national parks in which the flora is largely unknown, which makes effective management difficult or impossible.

Where the habitat is lost the next best thing we can do is grow plants in botanic gardens. We are reaching a stage in the conservation of the world's flora where we may have to start to resynthesise ecological groupings. We may have a more political, economic and social benefit in terms of conserving what's left of the world's flora by adopting more of a developer mentality to restoration and management of ecosystems.

There is a nexus between *in situ* conservation in national parks, and *ex situ* conservation in botanic gardens, but it has not been generally

recognised or employed hitherto. Botanic gardens as centres of propagation experience, taxonomic knowledge and species ecology study are of crucial importance to any national park system and its conservation. It is apparent that while some endangered species are declining in nature, many are thriving in cultivation e.g. *Lotus berthelottii* Masf. from Madeira, *Ginkgo biloba* L. from China, *Delonix regia* (Bojer) Raf. from Madagascar, *Amherstia nobilis* Wall. from Burma, and the possibility exists for reintroduction back into nature of rare species given restabilisation of habitat.

The close collaboration between Black Hill Flora Centre and the National Parks and Wildlife Service in South Australia has enabled reintroduction of a few rare species into natural habitats in local national

parks. For instance, *Olearia microdisca* J Black (Asteraceae) and *Beyeria subtecta* J Black (Euphorbiaceae), rare and endangered species from Kangaroo Island, have been reintroduced to Beyeria Conservation Park.

In China, the Academy of Science and the government have listed 389 plant species as protected. Ten botanic gardens have, for the past decade, been engaged in co-ordinated study of these rare and endangered species, introducing them to cultivation and devising propagation techniques, so that the nursery trade, both in China and the West, does not threaten the rare and endangered species in nature. Although many of these beautiful plants have been introduced to the West the natural populations have been devastated.

Many species are highly ornamental and include the genera

Rhododendron, *Magnolia* and *Camellia*.

Unless each Australian State conserves its endangered species according to a clear policy, our flora will continue to become impoverished. Unlike many other countries with conservation problems in the wet tropics and arid lands, Australia is a relatively prosperous nation and there should be an expectation for Australia to practise what it preaches. It is worth noting that in highly urban societies such as Germany and parts of North America, botanic garden displays increasingly tend to emulate the lost wilderness. If we in Australia fail in the next 50-100 years to better conserve our own wilderness areas, it is likely that botanic gardens here will also be required to emulate what has been lost – our own Dreamtime.

Friends of Botanic Gardens Throughout the World

Country	Gardens	'Friends'	Country	Gardens	'Friends'
Australia	56	25	Kenya	4	1
Austria	11	4	South Korea	4	1
Belgium	14	3	Mexico	15	1
Brazil	10	1	Netherlands	32	16
Cameroon	2	1	New Zealand	16	6
Canada	17	9	Norway	5	3
China	43	8	Peru	2	1
Colombia	9	1	Poland	23	1
Costa Rica	1	1	Portugal	5	1
Cuba	4	1	Senegal	3	2
Czechoslovakia	30	3	South Africa	17	10
Ecuador	1	1	Spain	8	2
Finland	8	1	Sri Lanka	5	1
France	56	14	Switzerland	20	8
West Germany	52	13	Thailand	5	1
East Germany	14	3	United Kingdom	55	24
Hungary	15	3	British Virgin Is.	1	1
India	56	11	United States	233	133
Indonesia	4	1	Hawaii	9	4
Ireland	7	1	USSR	125	6
Israel	7	3	Venezuela	6	3
Italy	42	3	Yugoslavia	21	4
Japan	48	19	Zimbabwe	3	1

From *The International Directory of Botanical Gardens*, fifth edition, 1990.

Familiar Scenes in the Botanic Gardens 1932-33

by Heather Ironmonger

The Australian artist RUPERT BUNNY lived in Melbourne as a child, and we can assume that he often visited the Botanic Gardens. His beautiful, stylish, German mother Marie was a friend of Baron Ferdinand von Mueller, who is said to have kept the Bunny household in Inkerman Street, St Kilda supplied with exotic plants from his nursery at the Botanic Gardens.

Rupert Bunny's sister Hilda, Mrs Donald Mackinnon, recalled that 'the old baron' was so frequently at the house all through her childhood that he seemed part of it. 'He gave Mama many plants and trees for her garden', she wrote in *Table Talk*, 'as well as naming one of the Western Australian ericas *Marie Bunnya* after her'. She believed that pepper trees in their garden were raised from the first *Shinus molle* seeds sent to Australia from Brazil for Mueller.

Hilda remembered Mueller as a 'queer, grumpy old man...always wrapped up in wide woollen scarves and heavy overcoats, even on hot days. He was terrified of draughts and fresh air, and rumour had it that he was not too partial to baths.' She added 'In spite of his humorous side, or perhaps because it amused her, Mama was kind and hospitable to him, and Papa was always happy to please her'.

Rupert Bunny went to Europe as a young man and lived in Paris from 1886, becoming deeply immersed in French life and culture. He achieved considerable success, but his fortunes declined when his style of painting was overtaken in popularity by 'moderns' such as Matisse and Picasso. And of course few people, artists included, escaped the effects of the Depression.

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Oil sketch by Rupert Bunny for his Botanic Gardens series.
Collection: The University of Melbourne Museum of Art.

Returning to Melbourne from France in October 1932 as an expatriate, Bunny hoped that the visit would retrieve his financial position. His wife Jeanne, who had suffered a stroke and needed constant nursing care, remained in France; whether she was too ill to accompany Rupert or whether the money he raised on his house was sufficient for one fare only, we cannot be certain. The artist hoped to make a home for her in Melbourne. There's ample evidence that he was discouraged and depressed at this time - in fact he wrote that things couldn't possibly be worse.

Bunny took frugal lodgings above a shop at 147 Toorak Road, South Yarra, and within a week or so of his arrival in Melbourne embarked on a series of paintings of the Botanic Gardens. Urgently needing money, he probably thought that local subjects would have the greatest appeal to potential buyers. It was an unusual choice of subject, not attempted by other leading painters of the day.

Bunny produced 30 paintings between October 1932 and May 1933 for his series *Familiar scenes in the Botanic Gardens*. He depicted groups amid sweeping lawns and curving paths, oak trees, palms and ferns. Some paintings hinted at Melbourne's skyline. Pencil sketches of people and vegetation would be made on-site, and then scenes composed in the studio. Abandoning his normal custom of painting an 'oil sketch' as an intermediate stage before attempting the final canvas, Bunny appears to have produced spontaneous images on canvas for a number of the paintings in this series. Perhaps these days such works might be unkindly dismissed as 'pot boilers'. The critic Blamire Young wrote in 1933, 'As a series they are not impressive, for there is a lack of accent in them, and a distinct want of that personal delight in each group which could make the painting of them a necessity'. In an *Argus* article, Arthur Streeton provided Bunny with an excuse, commenting on the difficulty of creating an harmonious picture out of the mixture of deciduous trees and foreign palms found in the Gardens.

Colette Reddin, in her book of personal recollections of Rupert Bunny, wrote that 'Bunny gave us the impression he had really enjoyed creating the Gardens series'. He said that garden scenes were the only type of outdoor subject he felt confident about painting in Melbourne, so accustomed had his eye become to Europe. He loved Australia and its countryside, but admitted to having difficulty painting the Antipodean landscape - the gum trees and sweeping views universally popular at that time.

In Paris, Bunny was a familiar figure painting in the Jardin de Luxembourg and the Jardin des Tuileries. Back in Melbourne, he tried to find that urban, civilised quality he'd appreciated in Paris. As Colette Reddin pointed out, in Australia the abundance of space and of private gardens meant that public gardens did not have the same importance for recreation as those abroad. She asserts that Bunny provided more to the Gardens than just a pictorial statement. 'In both sketches and finished works, he injected something of his urbane quality which local artists might generally have lacked. These developed through long years of recording artistically-made settings in Parisian public gardens. Today, they make a valuable contribution to the depiction of the Melbourne scene' she believes.

Jeanne Bunny had a second stroke and died in May 1933; her husband left Melbourne for France shortly afterwards. The *Familiar scenes in the Botanic Gardens* were exhibited in the Athenaeum in Melbourne in July of that year. Mary Eagle, Curator of Australian Art at the

National Gallery of Australia in Canberra, comments, 'The pictures' lack of accent and their loose, almost random, pictorial organization have since been seen as positive attractions'. Despite a mixed reception from the critics, Melbourne's picture buyers liked the paintings. All but 13 were sold at the 1933 exhibition.

Some Australian galleries had purchased paintings during the 47 years Bunny was domiciled in France, but on the whole his work was not widely appreciated or popularly acclaimed in the country of his birth until a few years before his death.

Paintings of the Botanic Gardens were hung in a major retrospective exhibition of Bunny's work in 1946 at the National Gallery of Victoria - the first time a living Australian artist had been honoured in this way. Bernard Smith commented that the retrospective, and smaller shows in Sydney in the last decade of Bunny's life, re-established his Australian reputation. Bunny, who settled in Melbourne for a span of 15 years until his death in 1947 at the age of 82, reflected that the recognition came 20 years too late. Since his death, his work has been held in the highest regard.

The Commonwealth Art Advisory Board started collecting Bunny's paintings in 1947, buying three scenes of Melbourne Botanic Gardens - 'an eccentric beginning for a national collection' according to Betty Churcher in a foreword to Mary Eagle's book. Two - *Black swans* and *The naughty child* - had previously been lent by the artist to Maie Casey in 1940 and hung at the Australian Legation in Washington during her husband's term of office there. These paintings, subsequently purchased by the Art Advisory Board, are among five Bunny Botanic Gardens paintings now in the collection of the National Gallery of Australia in Canberra.

Familiar scenes in the Botanic Gardens which were priced at 25-35 guineas in the Athenaeum exhibition in 1933 have fetched up to \$15,000 on their rare recent offerings in Melbourne.



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The assistance of Deutscher Fine Art, Malvern, is also acknowledged.



SERENDIPITY IN SCIENCE: A NEW MEMBER OF PROTEACEAE

by Andrew Douglas



Dr Andrew Douglas came to the Royal Botanic Gardens in August 1994 from Louisiana State University as Pacific Dunlop Post-doctoral Research Fellow.

After studying lipids in animals at college, Andrew worked in a bank and a video store; when he returned to study, he switched to plants, having 'got sick of killing animals', and having a long-standing interest in flowering plants. His subsequent success has proved that to have been a wise decision.

What do a stand of trees in north-east Queensland, the White-Tailed Rat, a rock in the Museum of Victoria, a 120-year-old book written by Ferdinand Mueller, Proteaceae, and a botanist at the Royal Botanic Gardens, Melbourne have in common? The answer, in brief, is that the combination of all those disparate elements plus some serendipitous conversations have resulted in some dramatic discoveries and answers about the evolution of Proteaceae.

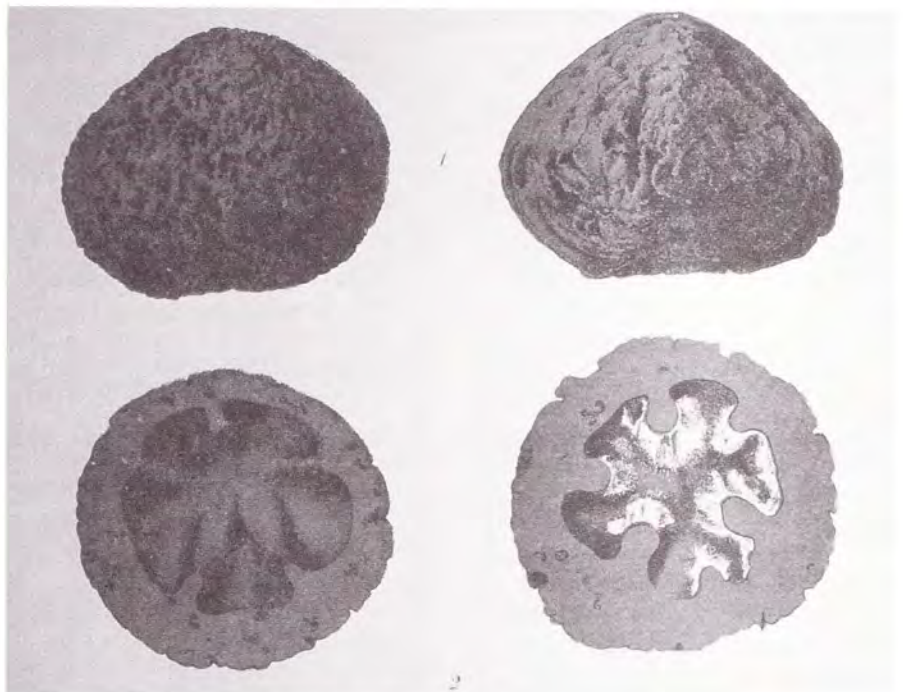
Members of the fantastic flowering plant family Proteaceae form a principal component of nearly all Australian plant communities, whether they be in heathland, rainforest, woodland or whatever. The family is composed of about 77 genera and upwards of 1300 species, the best known of which are the Australian Banksias, Waratahs, Grevilleas and the South African Proteas. Most of the genera are found in Australia and some others in South Africa, New Caledonia, South and Central America.

Most scientists have recognised that the family is a long-time isolate of the angiosperms (flowering plants), its nearest relative being unknown. There is, however, a split decision among scientists' interpretations of the origin or relationship of the family to other angiosperms. One school of thought considers Proteaceae to be a recently-evolved, and thus highly-specialised family related to groups like Santalaceae

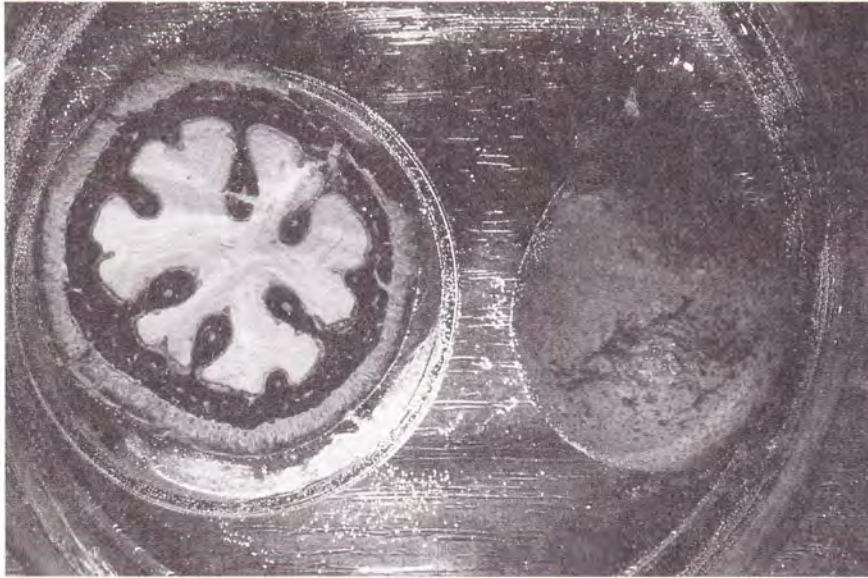
and Leguminosae. On the flip side, other scientists consider the family to be a primitive group that evolved early in the history of flowering plants. The collective nature of features in the flowers and recent studies of the relationships of Proteaceae to other angiosperms based on gene sequence comparisons (Drinnan et al, 1994; Chase et al, 1993) provide strong support that the plants represent one of 'Nature's early experiments in flowering' as had been suggested by Johnson and Briggs (1975) and Venkata Rao (1971). In other words, Proteaceae represents a primitive angiosperm family, evolved early in the history of flowering plants, possibly about 100-

110 million years ago (the origin of angiosperms is considered to be around 110-120 million years ago).

Current studies on the relationships of Proteaceae to other angiosperm groups indicate the family's closest living relatives are *Platanus* (Plane tree or Sycamore), *Sabia* (Snake-nut vine, a vine from Malaysia) and *Nelumbo* (the Water-Lotus). There are two interesting aspects of a relationship between Proteaceae and *Platanus*. The first is that, taking into account the number of Plane trees brought to Australia for use as street trees, it represents an accidental family reunion of sorts. The second relates to our



The fossil fruit described by Mueller in 1875



The living fruit

understanding of what a common ancestor between the Plane tree flower and proteaceous flower would be like. It is difficult to bridge the gap between the unique proteaceous floral morphology and its nearest living relatives. Proteaceae combines some strange characters in the flowers that are quite different from most other angiosperms. For example, each flower is composed of a single whorl of four tepals - most angiosperms have two or more whorls, usually one of petals and the other of sepals. The tepals of proteaceous flowers are showy and colourful (a general feature of petals) and are protective (a general feature of sepals). Additionally unusual is the arrangement of the four stamens. Each stamen is directly opposite, or next to, one of the tepals (epitepallous) - in most angiosperms, the successive whorls of organs of a flower are alternate with the preceding whorl. Also, the flowers have a single apocarpous gynoecium, a feature that is generally considered a primitive characteristic of flowering plants. Why are the flowers of Proteaceae so different from any of their hypothesised relatives? This question is currently guiding my research at the Royal Botanic Gardens, Melbourne and the University of Melbourne.

Two outstanding discoveries of the recent past have provided a new light to examine the diversity of Proteaceae. One comes from the discovery of a new tree growing in

tropical Queensland rainforests on Mt Bartle Frere. Dr Bernie Hyland of CSIRO has found several stands of a proteaceous tree (30-35 metres tall) that is quite unlike any other proteaceous plant. Dr Hyland originally found the tree in the early 1960s because of hundreds of extremely hard golf-ball-size nuts on the rainforest floor, each one perforated and hollowed out, evidently by the White-Tailed Rat. The fruit was unlike anything anyone had ever seen in nature; one of the nuts sat on Dr Hyland's desk, serving as a reminder of the diversity and the mystery surrounding it, because no one could determine what it was related to.

In the early 1980s Bruce Gray (also

at the CSIRO's Atherton herbarium) found the tree in flower. And thus the first mystery was solved. The fruit was the product of a tree in the family Proteaceae. Although it solved the relationship problem, the answer led to a plethora of questions, for instance, what is it related to in Proteaceae?

With support from the Australian Biological Resources Study through the *Flora of Australia* project, Dr Hyland and I described the new plant. We have determined that the flowers are very distinctive and lack most of the specialisations present in flowers of other members of the family. In February 1995, Dr Hyland found intact fruit from the tree that had somehow evaded the ravenous appetite of the White-Tailed Rat. The fruit is extremely strange and of visually unique appearance unlike any fruit of the angiosperms. The description of the new taxon is published in volume 16 of the *Flora of Australia*. Because of the unique and isolated position of the new taxon relative to other members of the family, we have described the tree as a sole member of a new subfamily in Proteaceae. The plant is called *Eidothea zoexylocarya*. The name 'Eidothea' represents the name of the eldest daughter of Proteus (the Greek god of camouflage or disguise for whom the family is named) and 'zoexylocarya' is derived from Mueller's description of a fossil nut (*Xylocaryon*), 'zoe' meaning 'live' or 'living' - hence 'living woody nut'.

Eidothea has relatively simple flowers compared to extant Proteaceae and most of the floral characters are general or primitive (plesiomorphic) based on the classification by Johnson and Briggs (1975) and as determined in a preliminary phylogenetic analysis of the family by me and Dr Sara Hoot of the University of Wisconsin, Milwaukee. Besides maintaining plesiomorphic (pp) features and sharing some features with other taxonomically disjunct taxa, the flowers and fruit of *Eidothea* maintain numerous unique or autapomorphic (aa) features that do not ally the taxon with any one proteaceous taxon. For example, the

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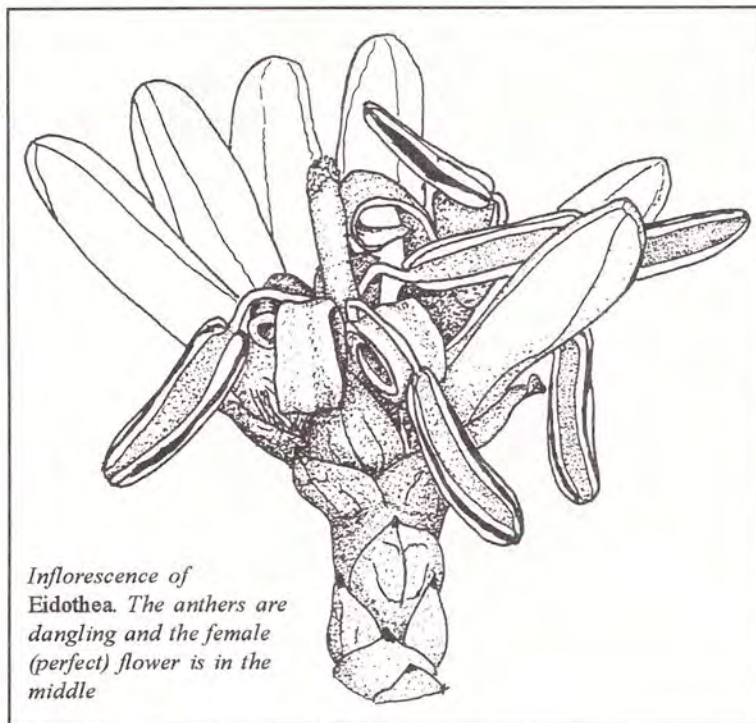
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8-15 flowers are arranged on a compact, indeterminate (pp) capitate inflorescence (aa). All but one (sometimes two) of the flowers of an inflorescence are functionally male. Each radially symmetrical flower (pp) is solitary in a bract axil (pp), and lacks a pedicel (aa). The whitish (pp) tepals are free and strap-shaped (pp) and valvate in bud (pp). The four stamens, each one opposite a tepal lobe, are free (pp), with basifixed anthers (pp) on thin/cylindrical filaments that are longer than the tepals (aa). Pollen comes out of the elongate anthers from the sides via longitudinal valvate slits (pp). The single carpel (pistil) is oriented dorsiventrally (pp), the carpal cleft facing the upper half of the flower, and is shortly stipitate (pp) with unmodified hairs (pp). There is no modification of the style (pp) and the stigma is a decurrent slit at the end and over the top of the carpel (pp). There is a single orthotropous (pp) and pendulous ovule (pp) that has longitudinally-aligned, broad ribs (aa). The flowers lack hypogynous nectaries. The fruit is a large nut, up



Inflorescence of *Eidothea*. The anthers are dangling and the female (perfect) flower is in the middle

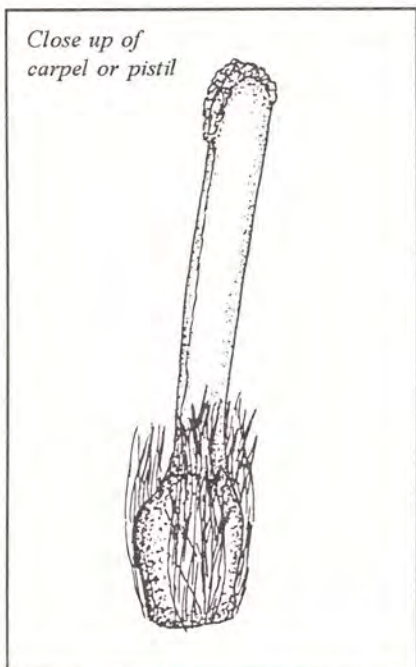
to 6cm in diameter, with an indehiscent (pp), non-fleshy exocarp and pericarp, and a fibre-laden endocarp (aa) that forms longitudinal ridges or ribs on the inner surface (aa). In fact, the fruit of *Eidothea* has been called the hardest nut in the Australian rainforest.

The unique collection of features in *Eidothea* can be interpreted as features that do not ally the taxon with other extant Proteaceae. Although it shares several features with other members of the family (*Sphalmium*, *Macadamia*, and *Beauprea*), the features are either

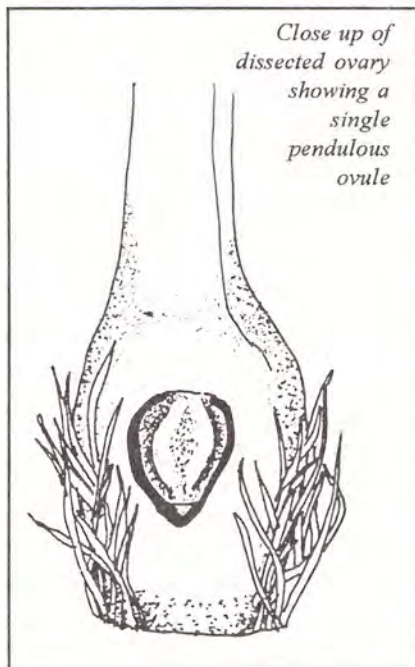
convergences or plesiomorphic within the family. The fact that *Eidothea* lacks or does not share features with any one genus of Proteaceae has been interpreted to mean that the taxon is isolated within the family and has been given subfamilial status. Preliminary cladistic analysis (a technique used to define relationships of organisms) of the family including *Eidothea* has resulted in an isolated basal position of the taxon, supporting the hypothesis that the taxon is not only a sole representative of a new

subfamily but could be one of the missing links between other angiosperms and Proteaceae. Hopefully a detailed phylogenetic analysis currently underway will resolve this issue. Concomitantly, gene sequence data is being obtained to provide an additional data base for phylogenetic comparisons.

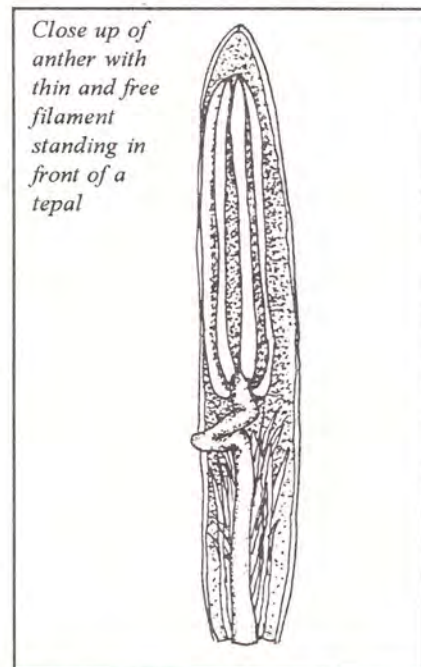
A chance conversation I had with a colleague led to an absolutely stunning rediscovery of something recorded by Baron Ferdinand von Mueller in 1875. Mueller described a fossil fruit *Xylocaryon lockii* (35-60 million years old) and referred to



Close up of carpel or pistil



Close up of dissected ovary showing a single pendulous ovule



Close up of anther with thin and free filament standing in front of a tepal

it as a 'grand fruit of a long bygone era'. The fossil fruit was found near Ballarat and until now botanists have been perplexed about its relationship to other plants. I showed the living fruit of *Eidothea* to a colleague, Andrew Rozefelds, a palaeobotanist/morphologist at the Tasmanian Herbarium, who made the association between the published lithograph of *Xylocaryon* and the living specimen. The fruit of *Eidothea* and the fruit of *Xylocaryon* are virtually identical in shape and form and are different from most other proteaceous fruits.

Preliminary investigations of the fossil remains support a link between *Xylocaryon lockii* and *Eidothea*. The fossil fruit is important in two respects. First of all, if allied with *Eidothea*, the common ancestor to the extant taxon was present in Australia between 30-60 million years ago. (Proper dating of the specimen is currently being reviewed.) Secondly, it provides additional evidence that the south-eastern part of Australia was once

composed of rainforest taxa, analogous to the extant communities of north-east Queensland rainforests (Christophel, 1993). Additionally important features being investigated include the dispersal agent for the taxon both then and now.

The combination of fossilised material and the extant taxon provide evidence that the 'relictual rainforests' of Australia are a vital harbour of angiosperm diversification. Additionally, the new taxon represents an outstanding botanical discovery that will affect scientific interpretation of the wonderfully strange and isolated plant family Proteaceae. Ironically, considering the diversity of proteaceous flowers now (just compare a *Banksia* to a *Grevillea* or a *Persoonia*), the combination of finding the extant taxon and fossilised taxon suggests that Proteaceae was even more diverse than the extant diversity would reveal.

The nursery at the Royal Botanic Gardens, Melbourne is currently

attempting to propagate the tree from cuttings and from some of the intact fruit sent to us by Dr Hyland. In fact, upon completion of this article, I was informed that the fruits had germinated in the Atherton nursery. If luck is on our side and we can get the plant to grow in Melbourne, it could be one of the biggest homecoming parties Melbourne has ever seen. After all, it isn't every day that a relative comes to visit after 60 million years! The events surrounding this discovery genuinely show that the art of discovery in science is often full of chance and surprise.

'Friends groups, apart from the partnership formed with the land managers, are an important conduit for community comment and expectation of these well loved assets. Each of you provides meaningful support both physically and in terms of promotion and public profile.'

The Hon. Mark Birrell, Minister for Conservation and Environment, addressing the Conference of the Association of Friends of Botanic Gardens (Victoria) at Benalla, in April 1995.

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SCIENTISTS KEEP GARDENS' UNINVI

*The Flying Foxes proclaim their presence
are stealthy and largely unseen. But bot*

Spotlight on Night-flying Foxes...

by Roslyn Semler
Public Programs and Development Division,
Royal Botanic Gardens

There's been movement in the Fern Gully, for the word has got around...that there's an abundance of food, branches to hang from and a captive audience of intrigued visitors to watch and wonder.

The Grey-headed Flying Foxes, commonly known as Fruit Bats, have been a presence in the Gardens since 1981 when a small group set up camp in the Fern Gully. Found along the eastern seaboard of Australia (Townsville to the border of Victoria and South Australia), the Fruit Bats are one of the largest species of bats in the world. They have a wing span of up to 1.2 metres and at maturity can weigh as much as 600 grams. Their favourite food is eucalyptus blossom, but they are also happy to snack on the fruit of native trees such as Moreton Bay Figs or cultivated fruit trees including grapes, loquats, persimmons and pomegranates.

These migratory mammals were recorded in the Melbourne area as early as 1903. Their numbers have increased gradually over the century, particularly during the 1980s, to 1263 at last count (September 1995). Co-incidentally, the area's population of Rainbow Lorikeets, which has a distribution similar to the Fruit Bats, has expanded rapidly. It is thought that the proliferation of the bats and lorikeets relates to the maturing of fruit trees and abundantly flowering eucalypts (from other parts of Australia) in suburban Melbourne, providing a more stable and regular food source. The Fruit Bats usually migrated north from southern Victoria towards the end of autumn, returning again in early summer. In recent years, however, they have been developing permanent camps, such as in the Fern Gully, indicating that food supplies 'down south' are adequate for their survival year-round.

The dramatic increase in the number of Grey-headed Flying Foxes camping in the Fern Gully is causing some concern about the potential damage to the trees where they roost. ESSO has generously agreed to sponsor a management plan and community education and media strategy about the Fruit Bats. The study, being undertaken by Ecology Australia, will document the feeding, roosting and mating habits of the bats, estimate

their numbers throughout the year and provide recommendations on how to manage the colony without risking damage to the Gardens' plantings. To date, the highest tally was 2619 in May 1995. Results of the study will be available early in 1996.

How do these animals survive such an upside down life? Why don't they fall out of the trees while they sleep? And how do they prevent the blood rushing to their heads? Fruit bats have special tendons which cause their claws to automatically contract around a branch while they are hanging. It takes a conscious effort for them to open their claws if they wish to move or fly off. Some birds have a similar arrangement to prevent them from falling off their roosts. To prevent blood pooling in bats' heads, major blood vessels to the heart are able to contract. This aids circulation away from the head and back to the heart.

Fruit Bats live a truly elevated existence. In fact, from the time they are born (caught in the wings of their mother - while still hanging upside down!) to their death about 10 years later, they may never touch the ground. During the day they hang from branches at the tops of trees, flying out at night to forage for food. The closest they get to the ground is when they swoop over water bodies such as lakes and rivers to drink. Just lucky, because the bones in their legs are extremely light (helping to reduce their weight and assist them to fly) - so light they would not be able to stand upright even if they wanted to.

Fruit Bats depend upon their highly specialised vision for navigation, unlike small insectivorous bats which use high-pitched sonar to find their way around. They are a gregarious species and are often heard squabbling over roosting positions during the day. They have a distinctive, musky smell caused by chemicals released from glands around their neck. This is thought to assist mates and young to identify each other, and is also more prevalent in males during the breeding season.

Illustration: *Grey-headed Flying-fox from With Wings on their Fingers - an intimate view of the Flying-fox written and illustrated by Pamela Conder (Angus & Robertson 1994). This was judged Best Popular Natural History Book in the 1995 Whitley Book Awards (Royal Zoological Society of NSW).*

