

The cover features a close-up photograph of a log covered in various lichens. The top portion of the cover is a light grey horizontal band containing the title and subtitle. The main image shows a dark, weathered log with a dense growth of pale green and white cup-shaped lichens on the left, and a more intricate, yellowish-green branching lichen on the right.

Fronde

*Friends of the Australian National Botanic Gardens
Number 88 April 2018*



Friends of the
AUSTRALIAN NATIONAL
BOTANIC GARDENS

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Email or post material to the *Fronds* Committee at the above addresses or, place in the Friends letterbox, located inside the Gardens' Visitor Centre, between 9.30 am and 4.30 pm, Monday to Sunday. Editorial messages: telephone (02) 6250 9548.

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Golden Moon Glow Lichen (*Dimelaena oeina*) Pencil drawing, Emma Kelly, from the exhibition *Small Worlds*

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Front Cover: Two lichens, *Austroparmelia pseudoreclina* & *Cladia aggregata* (the green & spiky one), The Pinnacles. A photograph from an exhibition by Brenda Runnegar, *Small Worlds*, Visitor Centre Gallery, January 2018. The aim of the exhibition was to highlight the diversity and beauty of these often overlooked and inaccessible mosses, lichens and fungi. Identification of the items included in the exhibition was assisted by ANBG staff Christine Cargill, Heino Lepp, and Judith Curnow.

Digitising lichens and more

Denis Warne

Tucked away near the Gardens' library is that part of the Australian National Herbarium responsible for preserving specimens of cryptogams – fungi, lichens, bryophytes (mosses, hornworts and liverworts), algae, and ferns. Over the years the Friends have supported this aspect of the Gardens work, funding development of and enhancements to the Bryophyte, Fungi, and Lichen websites (see inset). Most recently, the Friends have funded the Lichen Digitisation Project which achieved its goals and more in November 2017.

The Cryptogam herbarium holds over 300,000 specimens, but some 1600 of these, mostly lichens, are particularly precious. They are the internationally recognised Type Specimens – the

Cryptogam websites sponsored by ANBG Friends
www.anbg.gov.au/bryophyte
www.anbg.gov.au/lichen
www.anbg.gov.au/fungi



benchmark specimens, nominated by the botanists who first described each new species. They define that species to the world. It is this 1600 that were digitised in the Project.

Herbarium specimens are more than just the organisms themselves. Each specimen is accompanied by the notes of the collecting botanist including defining characteristics, collection location, and other comments. There may be freehand sketches or images, and the results of any chemical analyses. All this supplementary material must also form part of the digitised material.

Benefits of digitisation are widely recognised these days among the scientific



Phaeoceros engelii (hornwort), herbarium specimen and specimen in the wild

community. First of all, internet publishing, in this case as part of the Global Plants Initiative (plants.jstor.org), aids international scientific collaboration. Perhaps more importantly for the Herbarium, it helps protect the specimens, some of which may be over one hundred years old. The need for the specimens to be shipped across the world, with potential for loss or damage, is greatly reduced.

Against this background a pilot project here in the Gardens in 2016 established a protocol for the digitisation of cryptogams and generated the first 150 images of lichen specimens. At that point the Friends, jointly with the Centre for Australian National Biodiversity Research (CANBR), agreed to fund the digitisation of the remaining 1030 lichen Type Specimens in our collection.

Digitisation of cryptogam specimens brought its own special challenges. Specimens of flowering plants and ferns are typically pressed, dried and mounted on cardboard providing a two dimensional presentation which is readily handled and imaged. Cryptogams, other than ferns, on the other hand, are not pressed, both to preserve form and because they often come attached to a piece of the rock or log on which they grow. Cryptogam specimens are three dimensional and are typically stored in folded envelopes or small boxes. This complicates both the handling and the imaging.

But all challenges were met and the project delivered. In fact, not only were the lichens digitised as originally planned, but all the fungi and bryophyte Type Specimens were digitised within the original budget, bringing the total to 1600. All the digitised data is now available globally on JSTOR's Global Plants site.

Cryptogams are fascinating. Should you want to dabble, each of the Friends-sponsored websites is spectacular (see inset for links). If you want to see the digitised product, you too can go on

CONTD. P4

Digitising lichens & more (contd.)

line to the repository on JSTOR at plants.jstor.org. A word of caution, this repository is made for scientists who know the scientific name of at least the species, or its family or genus, that they are looking for. Have a go - try an advanced search with Family: PARMELIACEAE and Herbarium Code: CANB.

A final note of interest: we have all no doubt observed the delicate presence of lichens on rocks and logs as we stroll. At the microscopic level they can be even more fascinating. A lichen is, in fact, not a single organism, but a symbiosis of two or more organisms, one a fungus the other(s) algae or

cyno-bacteria. They are considered as one entity as the fungus cannot survive without its symbiotic partner(s).

Many thanks to Drs Chris Cargill and Cécile Gueidan for their time and a fascinating conversation on cryptogams and their digitisation.

All images: CANBR



An example of a digitised Herbarium specimen. This one is for *Hertelidea wankaensis* (lichen) including the typical associated information

Seed imaging project – a hidden world exposed

Brook Clinton

Over 1000 species of Australian native seed from the collections of the National Seed Bank here at the Gardens are now available as digital images thanks to a project just completed by the Centre for Australian National Biodiversity Research.

The images, and accompanying precise measurements of seed traits taken during the imaging process, help to explain the biological and ecological function of these important species. The images, each with a corresponding herbarium voucher specimen, provide a definitive resource for land managers and also highlight the beautiful biodiversity of seeds.

The Australian Native Seeds: a digital image library project was supported through funding from the Bush Blitz Program, a partnership between Australian Government, BHP Billiton and EarthWatch Australia.

Explore the seed images on the Australian Plant Image Index to learn more: www.anbg.gov.au/photo/complex-search.html

Search class = 'nsb' for seed images, or search for particular species.

All nsb seed images are free to use under a creative commons licence, with the following attribution 'CC BY The National Seed Bank, ANBG'



Above: seed of *Hibbertia circumdans* which is also seen in the image below (the line at bottom right measures 1000 µm)

Below: the beautiful biodiversity of seeds (In order to identify each of the seeds in the image below go to bit.ly/2CNCv1h)



Vibration pollen collection at flowers of native *lasiandra*, *Melastoma affine* & the Darwin hypothesis

Roger Farrow

The native *lasiandra*, *Melastoma affine* (Melastomataceae), is a common pioneer shrub of the wet tropics and subtropics and is distinguished by its attractive mauve flowers that are present for much of the year. It has been confused with *M. malabathricum* but the latter has longer sepals and fewer flowers in the terminal clusters. *M. affine* is common throughout south-east Asia from where it probably colonised northern Australia, possibly at the peak of the last ice age when a land bridge to Papua/New Guinea existed. The nectarless flower is unusual in that it has two types of stamens (heteranthy): one central set of five with pale filaments each terminating in conspicuous yellow anthers and a second, outer set consisting of curved pink filaments branching from yellow forked structures and terminating in purple, cap-like anthers (1). Both types of anther release pollen through apical pores (poricidal anthers) when stimulated by thoracic vibration from a visiting bee, the so called **buzz pollination** mechanism. In most plants, the anthers split longitudinally to expose the pollen for collection. In *Melastoma* ssp. a simple style projects between the outer stamens. Individual plants are self-compatible but the individual flowers are not (autogamy) and require pollen transfer between flowers by a carrier to ensure fertilisation. Although the central anthers are yellow, the pollen grains contained inside are white.

Solitary bees visit these flowers to collect pollen to provision their larvae with food at their nests. The pollen is usually packed in baskets of bristles (scopae) on the bees' legs or on the underside of the abdomen for transport but in hairless bees it is stored in the crop. There is no guarantee that any of the collected pollen will land on the stigma of another flower to ensure cross-pollination, unless

some loose pollen on the bee vector is deposited on the stigma when the bee brushes against it. Most bees are particularly attracted to the yellow of the central anthers because this colour is thought to indicate a good pollen source, but it is not clear what attracts them to land on the purple outer anthers.

Over a two-week period, I recorded four different solitary bee species collecting pollen from *Melastoma* flowers at the edge of rainforest at two places in the Daintree: one at Cape Tribulation at the Dubuji and at Diwan in the garden at my property (2). No honeybees were seen on the flowers although they are present in low numbers in the area. They are not buzz pollinators. One blue-banded bee, *Amegilla cingulata*, was seen flying around the flowers of the *Melastoma* but not landing. I also saw several weevils, *Baris* sp., and a bush cricket nymph, *Caedicia* sp., feeding on the central anthers.

The first species observed was *Palaeorhiza disrupta*, a wasp-like, hairless, short-tongued bee in the plasterer bee family (Colletidae: Hylaeinae). It stores pollen in its crop and constructs its nests in natural holes in stems and twigs. This species is endemic to tropical north Queensland and is thought to have arrived here from Asia via the land bridge at the peak of the last ice age. The etymology of the genus means 'ancient root' from the Latin and the species was originally thought to be the ancestor of the modern bees but molecular studies suggest that Colletidae are a later derived group, although *Palaeorhiza* would be ancestral within this group. This species was observed moving rapidly between the two types of anther and extracting pollen (3) at both Dubuji and Diwan.

The second bee observed on *Melastoma* in my garden at Diwan was *Mellitidia tomentifera*, a ground-nesting, short-tongued, solitary bee in the family Halictidae, that has only been reported from the Cairns region. Again, it was



1. Flower of *M. affine* showing two types of stamens with poricidal anthers and the stigma and style (centre right)



2. *Lasioglossum* sp. (left) and *Palaeorhiza disrupta* (right) collecting pollen at Diwan. Note the white pollen contained in the basket of the hind leg of the *Lasioglossum*. The *Palaeorhiza* stores pollen in its crop.



3. *Palaeorhiza disrupta* collecting pollen at the central anthers. The forked structures are at the join between the two sections of the outer filaments. The stigma and style extends to the left. One of the outer anther caps and terminal pore is shown at the bottom of the picture.



4. *M. tomentifera* extracting pollen from the outer anthers and inducing pollen discharge. The stigma is to the right of the bee

observed moving rapidly between the two types of anthers collecting pollen (4). The pollen is stored for transport between bristles (scopae) on the hind legs and some supplementary bristles on the side of the thorax. This bee was also seen visiting other flowers in the garden, notably *Cuphea* sp (exotic).

The third and commonest bee observed at Diwan was a species of *Lasioglossum* (*Chilalictus*) also in the family Halictidae. This small bee invariably landed on the outer rather than the central anthers (5a) and spent most of its time on the former collecting pollen. It was obviously successful at this task as it could be seen transferring pollen to its scopae on the hind legs. This bee is also suspected of being a destructive pollen collector, biting into the closed anthers that then release a cloud of pollen (5b).

The fourth bee seen on the flowers at Diwan is possibly a species of *Homalictus*, a small, ground nesting bee in the family Halictidae but it was not observed buzz pollinating.



5a. *Lasioglossum* (*Chilalictus*) sp. attempting to extract pollen from the terminal pore of the anther. The stigma & style are top right.



5b. Pollen cloud emitted from an anther bitten into by the *Lasioglossum* bee
All images: Roger Farrow

In a study of *Melastoma* pollination undertaken in the Paluma area near Townsville by Gross (1993) eight species of bee visitor were identified, of which only four: two blue-banded (*Amegilla* spp.), one carpenter (*Xylocopa* sp.), and one *Nomia* were involved in pollen transfer between the outer stamens and stigma, by buzz pollination. The large bees in the genera *Xylocopa* and *Amegilla* were not observed visiting *Melastoma* in the Daintree during the observation period but may be more active at other times of the year.

While I was not able to view the ejection of pollen from the terminal pores of the outer anthers during buzz pollination, several studies have confirmed that the bees are sprayed with pollen in response to the vibration of the thorax and wing muscles. This has been mimicked with a tuning fork (Wee 2014). It has also been shown that this pollen, rather than the pollen from the central anthers, is involved in transfer to the stigma and cross fertilisation because some is placed out of grooming reach of the bees involved (Luo et al 2008). It is not clear what is attracting bees to the outer anthers where no pollen is visible unless there are odour or nectar attractants involved.

Charles Darwin was the first to discuss the contradiction between the supply of pollen as an attractant and food for flower-visiting insects and the need to ensure that some pollen was used in fertilisation. He proposed that there could be a 'division of labour' among stamens between those providing food and those providing pollen for reproduction, the situation found in *Melastoma*. The function of the two kinds of stamens in members of the Melastomataceae was recognised as early as 1882 by Henry Forbes (Forbes 1882), coincidentally the year of Darwin's death.

Other Melastomataceae, including native plants in the genera *Medinella* and *Osbeckia* and exotics including *Dissotis* (Spanish shawl) from Mexico

and *Tibouchina* from Central and South America (both introduced garden plants in Australia) also have dimorphic stamens, presumably with the same function, but pollen collection has not been studied in these species, as far as I am aware. Other native members of this family in the genera *Memecylon* (poor flower), *Otanthera* (bush strawberries) (8) and *Pternandra* (cursed shade) have only one type of porocidal anther.

Although insects are often described as pollinators, they are fundamentally pollen harvesters and feeders or are attracted to flowers by other attractants such as nectar, scent and other chemical odours. They are not altruistic pollinators per se and the act of pollination occurs as a result of often chance contacts between pollen-covered parts of an insect and the stigma. The complex behavioural interactions and morphological adaptations between flowering plants and their insect visitors, one of which is described here, are often described in terms of co-evolution but I believe it is better interpreted as a mutual exploitation, as suggested by Westerkamp (1996).

I would like to thank my colleague Michael Batley for identifying the bees and for helpful discussions on buzz pollination, bee biology and evolution.

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Eucalyptus dye research at the ANBG

Sally Blake

I am a Canberra-based visual artist who works with natural materials and processes, including plants and their dyes. I was originally an artist-in-residence at the ANBG through the CraftACT program in 2014.

In 2016 I was fortunate enough to undertake an Australia Council-funded project at the ANBG which examined the bark and leaves of eucalypts for their dye colours. Eucalypts produce dyes which are fairly resistant to fading and the range of colours across the genus is

extraordinary, ranging from soft creams to vivid oranges and reds. The Eucalyptus Dye Database (sallyblake.com/eucalyptus-dyes-1) is a web-based resource in which I documented the dye colours from 230 eucalypt species growing at the ANBG, as well as the recipes I used to produce the dyes. Each week I collected leaf and bark samples with the ANBG rangers which were then used to dye a range of seven natural fabrics and threads. The colour range was extended by using three mordants—alum, iron

and copper. You may have seen the 2017 exhibition of the results, *The Colour of Eucalyptus* in the ANBG Visitor Centre

This year I have received ArtsACT funding to undertake further eucalyptus dye research at the ANBG. The focus of the current research will be the 40 plus eucalypts that grow naturally in the ACT. The research will include collecting plant materials for dyes and collecting meaningful, personal stories from people in the ACT about specific trees or a species of local eucalypts. During the 2016 research people volunteered many stories about their favourite eucalypts and these stories fascinated me. In the current research I will collate personal stories which examine eucalypts as physical and emotional indicators of place. These stories will inspire a new body of artworks.

As well as collating local stories about eucalypts, I will collect leaves and bark from the 40 plus naturally occurring eucalypts in the ACT, whose range extends from the Australian alps to the tablelands, to make dyes to colour natural fibres and threads. I will create a record of the dyes, and dye the raw materials from which I will develop artworks for exhibition. The leaf and bark collection will be done at the ANBG which ensures correct identification of each species.

Environmental sociologist Frank Vanclay writes, *'place' is generally conceived as being 'space' imbued with meaning*. Discovering the meaning that people find in connection to particular eucalypts will be a rich resource for developing work ready for exhibition. It will challenge and open up my practice to work with other people's meanings and connections to place. As I develop artwork in response to the stories I will use dye colours from the eucalypt particular to the story.



Held Mysteries, 2017. Eucalyptus dyed wool, silk and hemp, copper wire



Eucalyptus leaf drawing detail, 2016. Pressed eucalyptus leaves, pencil on paper

Working with local eucalypts means I can undertake more in-depth research. I will investigate the effect of place on dye colours by testing the dyes from the same species, from different locations. I will test the effect of seasonal and weather conditions on dye colours by collecting leaves weekly from the same eucalypt for twelve months.

Including stories and dyes in this project will provide physical data (from the dyes) and psychological and emotional data (from the stories) from which to develop a body of work about place. I already have received some stories, and have read

delightful tales of tree-huggers, about spiritual connection to particular trees and the use of various eucalypts in art practice. One story brings attention to the deciduous aspect of eucalypts as they shed their barks each year.

I am hoping that readers may have stories to contribute to the project. The stories can be long, short, poetic, scientific, funny, whimsical, a family anecdote, whatever people want to share. It seems to me that eucalypts are important physical and emotional place markers for many people. The dyes themselves change in response to seasonal changes, rainfall and

the biophysical conditions the trees are growing in. A plant's rootedness makes the dyes they produce excellent indicators of place. I may publish the stories either in book form or online in 2019 (but only with the permission of each contributor and dependent on funding).

I will use the stories as source material for a new body of artworks for exhibition in 2019. The project will be a meaningful way of linking art and science, the work of the ANBG with art practice. The collection and recording of the dyes will be undertaken following rigorous methodologies. The stories will provide another, less predictable element. The tension between order and emergence will provide a fertile ground for new artworks to arise in response.

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I would love to hear from you if you would like to contribute to this project.

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Frank Vanclay, 'Place Matters,' in *Making Sense of Place: Exploring Concepts and Expressions of Place through Different Senses and Lenses*, eds Frank Vanclay, Matthew Higgins, Adam Blackshaw (Canberra: National Museum of Australia Press, 2008), 3.



Dye Diary (eucalypt bark). Eucalyptus dyed wool, silk and linen



Dye Diary (eucalypt leaves), 2016. Eucalyptus dyed wool, silk and linen

Friendly Chatter

Photographic Group

The photographic group provides opportunities for Friends who have an interest in photography to share their experience while also extending their knowledge. Members regularly provide images which can be used for promotional purposes following involvement in Gardens events throughout the year, such as Summer Sounds and the Enlighten Festival or the construction and opening of the new Treehouse.



DEREK CORRIGAN

Photographic Group member Tim Leach presents Judy West, ANBG Executive Director, with a print of his photograph of the Macleay Swallowtail Butterfly, *Graphium macleanum*.

The new committee has planned an exciting year with a mixture of many inspiring speakers plus practical hands-on learning opportunities. The photographic group started the year with a special twilight access to the Gardens after official closing. After last year's successful meeting dedicated to hands-on macro techniques, the committee is planning a similar hands-on telephoto lens techniques workshop to be presented by some of our own bird photographers, followed by a practical bird photography morning at Jerrabomberra wetlands the next day.

Future events include, on 19 May, a full day basic photographic workshop open to all members of Friends who wish to take better photos by understanding the basic operation and principles of their camera. This 'Introduction to Photography Workshop' is offered at a cost of \$150 and will be a fund raising exercise for Friends. (see 'What's On' p21)

Details of our program are updated regularly on the Friends website. The Group always welcomes potential speakers and new members. Contact us at photo@friendsanbg.org.au

Derek Corrigan

Guides Activities

Guides have been busy over summer showing visitors the wonders of our Gardens on walks and Flora tours. December and January are peak times for visitors as shown in the statistics collected every day. More than 4000 visitors joined our tours in 2017.

Every tour is different as guides are constantly reviewing their knowledge of plants and guiding practice. In 2017, we introduced a new professional development program which encourages guides to undertake specific activities of their own choice in these two areas over a year. The first year of a two-year pilot is now complete and guides have embarked upon year 2. An analysis of the program is underway, and results will be presented in April. The program is endorsed by the ANBG.

Many guides developed new walks for the 2017 biennial Australasian Botanic Gardens Volunteer Guides Conference. These were a wonderful development opportunity for both the guides who developed them and other guides who acted as trial walkers. In 2018 we have several small research groups looking at particular areas of the Gardens including the new *Pomaderris* garden and the area around the Paperbark Treehouse. These professional development activities ensure that guides are able to continue to offer the highest standard of tours for visitors.

Christianna Cobbold

Growing Friends

After ending 2017 on a high with a lovely Christmas lunch, our meetings and propagation sessions have started for 2018. Several people have joined Growing Friends recently and we continue to welcome new members. Our meetings, followed by morning tea and a propagation session, are held on the first Saturday morning of each month, usually in the Crosbie Morrison building. A working bee is held on the third Tuesday of each month. Please talk to one of the **Growing Friends** today, or telephone John Connolly (0477 257 188) or Maurice Hermann (0429 361 256) if you'd like to join us.

Kath Holtzapffel has stepped down as our coordinator although remains an active member of the group. Growing Friends thanks Kath for her tireless efforts in this role over many years. John Connolly and Maurice Hermann are our new co-coordinators. Lastly, a special mention of thanks to Yvonne Robinson for her contributions to *Fronds* on behalf of the Growing Friends.

Wendy Merritt

The Growing Friends AUTUMN PLANT SALE will be held on Saturday 7 April. Details of the sale including a list of the available plants will be on the website www.friendsanbg.org.au one week prior to the sale. We have access to propagation material from the ANBG. You will be able to buy good quality plants, many of which you don't see in nurseries, at fantastic prices. And even better, the money raised from the sale goes to support the ANBG.

Botanic Art Groups

The Friends Botanic Art Groups are proud to present our annual exhibition open until 15 April at the Visitor Centre gallery. This year we have over 90 entries. Although each artist can submit one work of their choice, all other entries must be judged by a team of botanists from the Gardens to ensure botanical accuracy, as well as two artists who judge artistic merit. This year the judges, Halina Steele and Helen Fitzgerald, commented on the high standard of work which was presented.

Many artists have chosen to work in watercolour again this year, but some have chosen to use graphite, coloured pencil and black scraperboard. This year there was a special theme of **Threatened and Endangered Species** and some artists chose to paint or draw one of these plants as a subject. All work in the exhibition features native plants.

A member from one of the three Botanic Art Groups is available during the exhibition to answer questions about the work and to provide information about how to join one of the art groups, each of which meets once a month at the Gardens.

This year we have asked artists to present some of their work in a matted format which means that works are less costly and are easier to transport. A number

of cards will be for sale and there will be a raffle of a beautiful painting, *Grevillea* 'Burgundy Beauty' by Cornelia Buchen-Osmond.

All artwork is for sale. So bring your family and friends to the exhibition. Entry is free and all commissions go to support the work of the Friends.

Kate Ramsey



Qualup Bell, *Pimelea physodes* by artist Susan Spiller, watercolour.

Botanic Art Raffle Prize: *Grevillea* 'Burgundy Beauty' by artist Cornelia Büchen-Osmond, watercolour.

Plant Science Group

The Plant Science Group meets for technical talks on the first Monday morning of the month (public holidays excepted). Where speakers permit, we file talks on one of the computers in the Botanical Resource Centre for open access (viz: The right hand side computer as one faces the window).

The first talk for 2018 in February highlighted the increasing complexity of taxonomy and data storage. Anne Fuchs, Manager of the ANBG's Integrated Biodiversity Information System (IBIS) spoke on 'Maintaining databases for Names, Nomenclature and Taxonomy'

highlighting how to keep track of embedded information which forms the backbone of biodiversity data. After the presentation, Anne co-hosted a Q&A session with Anna Monro, ANBG's Manager, Botanical Information Group and Web.

In the second talk, 'Callitris: a chronicle of extinction, survival, dispersal and rediversification', Emeritus Professor Mike Crisp of the Research School of Biology, ANU discussed the rich and ancient fossil record of Callitroid conifers going back 140 Myr to Pangaea, including adaptation to the

post-Gondwanan world by migrating across oceans and diversifying into new environments, especially the fiery, arid Australian interior.

Our Plant Science Group subcommittee for 2018 comprises Anne Campbell (Convenor), Maureen Connolly, Murray Fagg, and Lesley Harland. Murray Fagg continues to arrange the speaking program, for which we are most grateful.

For further information or to be put on the emailing list, email: plantscience@friendsanbg.org.au or see the Friends Website under Activities.

Anne Campbell

An ANBG role in high altitude tropical plant conservation

Toby Golson

Up on the Atherton Tableland in north Queensland, at the CSIRO's Tropical Forest Research Centre, there is an extensive arboretum of over 800 Australian rainforest taxa. It was established by botanists Geoff Stocker and Bernie Hyland to serve primarily as a living collection for material for a comprehensive illustrated key of all known woody indigenous tropical rainforest species. Like the ANBG, the vast majority of this collection is linked to herbarium vouchers, and at the minimum, to extensive provenance records. The curator of the arboretum, Matt Bradford, emphasised it was open to public benefit and kindly agreed to send seed to us when available.

This transfer of material is crucial to developing the ANBG Rainforest Gully (RFG) collection since the high altitude flora of the Wet Tropics is not only generally suited to cultivation in Canberra but many of its component species are threatened by the effects of climate change in their wild populations. Hence they are prime candidates for ex-situ conservation. Difficulties with obtaining collecting permits in Queensland and general resource constraints, precluding field collection activities, also underlined the value and efficiency of this collaboration.



Sally at Atherton Arboretum in front of a magnificent Native Gardenia, *Atractocarpus fitzalanii*, a potential conservatory planting.

Over almost 10 years I pestered Matt with a plan to visit the Atherton Arboretum (AA) and also a number of experimental high altitude rainforest plots in the area that CSIRO had established as permanent monitoring sites in the 1970s. Finally, in early 2017, the Friends Public Fund agreed to cover half the project costs to send three ANBG staff *...to secure EPBC listed and climate change threatened high altitude rainforest taxa currently unrepresented in our collection, to assist in their long term conservation, thereby 'spreading the risk' in securing genetic material in ex-situ holdings as well as for horticultural and educational display.*

In addition to working with Matt, noted North Queensland amateur botanist couple, Garry and Nada Sankowsky,



One way to take cuttings! At Mt Lewis Forestry Hut with the ATH crew.

generously agreed to open their extensive private rainforest collection to us. Also we were to pursue opportunistic collecting of material suitable for display in the planned Ian Potter conservatory.

Following a Sunday of travel to Atherton I, with colleagues Caroline Chong from the seed bank and Sally Hawkins from the nursery, set off at dawn on Monday 9 October heading north through Mareeba. We were aiming for the fabled Mt Lewis Forestry Road which traverses the coastal range west of Mossman for 30 km, most of this length at over 1000 metres altitude. Growing on ancient granite, the flora here is some of the richest and evolutionarily oldest in the continent. Often cloud shrouded, we were fortunate to be enjoying the very end of the dry season and (sadly!) missed the anticipated mass of leeches and miles of mud and rivers of perspiration.

Twenty-eight km along the road, we reached the CSIRO plots; each one of these has been fully floristically documented and all of the large trees marked and plotted. With Matt's intimate knowledge, finding target trees was relatively straight forward, especially in this unlogged 'clean' rainforest which was easy to negotiate on foot. Obtaining good cutting material from 20-40 metre trees, almost all without low hanging lateral branches, was a challenge met by pulling small branches down with rope shot from a custom made bow Matt usually used for obtaining fertile specimens for herbarium vouchers. Back out on the road, the Sankowskys led some gentler roadside collecting necessitated by Garry having recently undergone major back surgery. With good company and an unlimited supply of suitable material to collect, the day flew and we arrived back in Atherton tired but buoyant that evening.

On Tuesday Matt took us to a second plot at a height of 1120 metres on Mt Haig, on the north shore of Lake

Tinaroo, in rainforest dominated by the magnificent emergent conifer Blue Kauri, *Agathis atropurpurea*. You can see two 3-4 metre saplings of this conifer in section 140 of the RFG.



The fernery at the Sankowsky's



Polyscias wilmottii beginning to flower at the Rhododendron site Mt Lewis Forestry Rd



Harpullia rhyticarpa fruit



Triunia montana was in full flower along the side of Mt Lewis Forestry Rd

The morning drive out east to the site gave us magnificent views of the Lamb Range and further south Queensland's highest peak, Mt Bartle Frere. Over the course of the day, we made another 11 collections from our priority list to add to the 14 from Mt Lewis, as well as a swag of supplementary material for both the RFG and conservatory.

On Wednesday we had the great privilege and pleasure of being guided around and collecting from the Sankowsky's two hectare garden near Tolga. Around 2500 species have been planted here over the last 35 years with Garry curating the woody species and Nada specialising in the cultivation of ferns, expertise she happily shared with us over a busy anecdote-filled day, interrupted only briefly by a feast of home-made scones and tea. One of the highlights here was trowelling out root suckers of the well-known bush tucker tree *Backhousia citriodora* originating from material collected at the species' northernmost population not far away at Silver Valley near Ravenshoe. Though extensively planted in our Gardens, this is our first collection of documented wild origin material. Among more than 30

collections made over the day, another eight were priority listed.

Thursday gave us another opportunity to sample Mt Lewis Forestry Road, this time in the company of Darren Crayn, Director of the Australian Tropical Herbarium, and his colleagues from James Cook University (JCU), Stuart Worboys and Alex Chessman. Once again we were blessed with good company, good weather and, most importantly, botanical expertise allied to specific local knowledge. We traversed the length of the road and armed with an extension pole high pruner made a series of collections, including the stunning *Triunia montana* which was in full flower. From the old forestry hut which marks the end of the drivable part of the road a short path leads through granite boulders and delicate *Linospadix apetiolata* palms, under a windswept low canopy of *Leptospermum woornooran*, to an extensive outcrop looking south back towards Mareeba. This was a perfect lunch spot with masses of *Rhododendron viriosum* and *Agapetes meiniana* trailing out from pockets of humus over the rocks amidst shrubby forms of *Alyxia orophila*,



Leptospermum woornooran canopy at Rhododendron site *Alyxia orophila* in foreground.

An ANBG role in high altitude tropical plant conservation (contd.)

Acrothamnus spathaceus and *Polyscias wilmottii*, all of which are growing happily at the ANBG. We returned home that night with another seven priority collections to process and pack away in ice boxes for the journey home.

Friday was designated for collecting from AA. While perhaps not as exciting as the rainforest proper, the diversity of this collection and the well-ordered stocktake map provided by Matt, meant there was no shortage of plants to admire and cuttings to be taken. We made over 30 collections including five priority species before farewelling and thanking Matt. A favourite here is the Fern Leaved *Stenocarpus*, *Stenocarpus davallioides*, which is well-known in the nursery trade for its beautiful juvenile foliage. Three four metre specimens are growing in section 159 in the RFG,



Zieria alata at the Rhododendron site

but this is our first chance to propagate wild provenance material. We spent the evening filling out field books, pressing specimens and packing our eight excess luggage pieces.

A midday flight from Cairns on the Saturday meant a leisurely early morning drive across the coastal range past Kuranda and a quick half hour at Cairns Botanic Gardens to visit their conservatory. We arrived safely back in Canberra and, with a quick detour to the nursery to transfer cuttings to fridges for processing on Monday morning, returned to the comfort of our own beds.

From a search of herbarium records and relevant literature, there are approximately 90 woody taxa that grow above 1400 metres in far north Queensland of which 15 are currently cultivated in our



Toby at lunch at the Sankowsky's

living collection. Of the 75 remaining, 56 were identified as growing in the Mt Lewis and Haig areas we visited, at the AA or at the Sankowsky's. We secured propagation material from 45 of these species and, in a small number of cases, obtained seed as well as cuttings. In addition, again for a small number of species, we secured material from two provenances. That we were able to do so is almost completely due to the generous assistance provided in particular by Matt as well as the Sankowskys and Darren and the JCU crew.

I would like to thank the Friends, whose crucial funding enabled the trip to proceed, and my companions Caroline and Sally for their hard work and perseverance. I look forward to monitoring progress of the large amount of material now safely secured in our nursery and to planting it out and growing it on. I also look forward to future opportunities to take Friends groups around the RFG to observe the anticipated plantings and share a little more intimately the stories of their acquisition.

(Join Toby on a walk in the ANBG Rainforest Gully to see and hear about the new plantings from material collected on his field trip in 2014. Details p22)

ALL PHOTOS: CHAROLINE CHONG

Loss of Big Badja Gum leads to new opportunities

If you have visited the Gardens recently, you will have noticed the loss of the tall, old *Eucalypt badjensis* which towered over the top car park near the bus shelter (Section 174).

A native of south eastern NSW, the *E. badjensis* is a threatened species, occurring only in wet forest areas. Although there is a small number of other specimens in the Gardens, this one was a rare beauty and was also special in being so accessible. The tree provided an effective shade canopy for the garden below,

home to a group of large *Macrozamia moorei*, and many other plants which appreciated the protection from sun and frost. Sadly, it had to be removed after its top fell on the garden and path below, crushing many of the other plants.

The positive result of the demise of the tree, however, has been the decision to re-design the garden to create an even more special and spectacular entrance to the Gardens as visitors enter from the car park.

David Taylor, Curator, Living Collections, tells us that a new landscape plan is being developed by the Living Collections team for the area which stretches along the main path, up to the Visitor Centre. The garden will become a showcase featuring some colourful and eye catching plants such as multiple flowering *Corymbia* cultivars, spectacular Kangaroo Paws, and other 'best of' selections, with the aim to introduce visitors to a sample of the amazing array of native flora to be found as they venture further into the Gardens.

What's new in the ANBG Image Collections?

Over the last year the Australian Plant Image Index (APII) has had a significant boost to its Western Australian coverage with a donation of over 2000 photographs by Kevin Thiele.

Originally from Victoria, Kevin has had a long association with the Australian National Herbarium in Canberra since first being employed there in 1985 and later as a Post-doctoral Fellow from 1993-95. He has also had a long association with APII, first donating photos in 1995. After undertaking a range of botanical projects he was appointed Curator of the Western Australian Herbarium from 2006 until 2015.

This period in Western Australia is the source of his latest donation. Kevin's photos have a distinctive style, taken in a mini-mobile-studio against a black background he uses long exposures and a very small aperture to obtain an impressive depth-of-field. He also hones in on the flower itself to reveal its detailed structure.

This donation helps to fill a gap in our collection of plants from Western Australia's rich flora. It includes 1587 species, many still to be formally described and named, but all linked to herbarium voucher specimens.

Murray Fagg

Kevin Thiele's recent donation of WA photos to APII can be viewed here:

www.anbg.gov.au/cgi-bin/photo?FORMAT=TABLE&010=dig&BY%2020=1&280=Thiele%25



Baeckea sp. Yuna (M.E.Trudgen 2224) WA Herbarium. An example of an unnamed species in APII
www.anbg.gov.au/cgi-bin/phtml?photo_class=dig&photo_no=47699



Amphipogon turbinatus
www.anbg.gov.au/cgi-bin/phtml?photo_class=dig&photo_no=47494



Stylidium dichotomum
www.anbg.gov.au/cgi-bin/phtml?photo_class=dig&photo_no=46179



Marianthus tenuis. An example of a species new to APII
www.anbg.gov.au/cgi-bin/phtml?photo_class=dig&photo_no=45443



Eucalyptus badjensis: Other good specimens of *E badjensis* can be found in Section 18 (next to main path leading to lower Eucalypt lawn), Section 300 (next to top Eucalypt lawn) and Section 196, next to the CSIRO Herbarium gate (on the way to the nursery) See article p14.



BARBARA PODGER

CHRIS MANCHESTER,
AUSTRALIAN NATIONAL INSECT
COLLECTION



Correction & apology:

This image (on page 6 of *FronDS* December 2017) of the cockroach found on the Namadgi/Kosciuszko National Parks Bush Blitz was incorrectly named *Heteroptera*. It is in fact an Alpine/ Mountain Cockroach species *Polyzosteria viridissima* specimen.

Gardens Shorts

Executive Director's Report

As usual it is never a dull moment around here at the Gardens as we continue to develop our public programs and the Gardens.

I am pleased to report that the various activities in the Gardens over the 2017-18 summer months drew record visitor numbers. Attendance for the two weekends of the 2018 Summer Sounds was well above average compared with previous years. The success of the concerts is a reflection of the great partnership between the Friends and the Gardens in organising these events, along with the support of ICON Water. *Snakes Alive!* also reached record numbers thanks to great weather and publicity. We were happy to welcome Sunset Cinema back to the Gardens for another season of films on the Eucalypt Lawn.

The Paperbark Treehouse is proving to be another huge success in the Gardens. Since its opening, kids and families have been flocking to explore the treehouse and landscaping funded by the tremendous efforts of the Friends. This achievement would not have been possible without the Friends' support, and is another

example of our successful collaboration. We have extended the Paperbark Garden experience for visitors even more with a winding, interactive educational trail perfect for families of all ages with funding from the IMB Community Foundation.

There has been a bit of shuffling of staff over the past months within Parks Australia and the Gardens. Sally Barnes has left her position as Director of National Parks. In the interim, I have the privilege to take on the role of Acting Director of National Parks while still maintaining my role as Executive Director of the Gardens. Our General Manager, Peter Byron, is acting as Branch Head of the Corporate Services Branch of Parks Australia. Lastly, Stephen Speer has retired as Manager of the Visitor Experience team.

Rethinking Pomaderris

With a great sense of anticipation the first plants in the new *Pomaderris* Garden have been planted under the watchful and discerning eye of Gardens' horticulturalist and custodian Rosella Hampshire.

The transition from a wild, largely inaccessible *Pomaderris* planting to a transformed space with new access paths running through it, sculptured

surfaces to harvest water and the carefully designed and placed plantings has been nothing short of dramatic.

'The goal was to renovate the area and create an engaging garden that is readily accessible, visually appealing and well-defined.' Rosella said. 'The design aims to highlight significant species with potential to develop a strong narrative about the important aspects of this plant group.'

One way Rosella is engaging people with this lesser known group of Australian flora is displaying plants in a way to inspire people to use them in their gardens. Rosella has taken this to a new level with a multi-species hedge-screen planting now running down the entire eastern edge of the garden that she will guide gracefully to maturity with careful pruning. Many of the rare species have been located in prominent locations next to paths to highlight their significance and provide the Guides and Friends good access for story-telling.

The next stage will include additional species and an interpretive element focussing on the conservation partnerships the Gardens is involved in for threatened *Pomaderris* species and what is special about this group of plants.



BILL HALL

At the opening of Paperbark Treehouse



M FAGG, APRIL ©

Pomaderris intermedia & mixed planting of *P. lanigera* & *P. intermedia*, Coombs Building, ANU

From thicket to Paperbark wonderland

Kids are coming to explore the Paperbark Treehouse and surrounding landscaping funded by the Friends of the Gardens and opened late last year.

Now, thanks to a generous donation of \$20,000 from the IMB Community Foundation, the Gardens have extended the Paperbark Garden experience for kids, with a winding, interactive *Who Did That?* educational trail perfect for families of all ages. The trail, nestled in the forest canopy of the Paperbark Garden, is a fun way for kids to learn all about the exciting plants and animals of Australia's *Melaleuca* forests.

Together, the Paperbark Treehouse and *Who Did That?* children's trail have transformed the previously impenetrable stand of *Melaleuca* trees into a wonderland.

The plantings themselves have evolved over time from a single stand of

paperbarks into a significant habitat reminiscent of many wild areas found across Australia where there is water and *Melaleuca*. The main Paperbark species is *M. ericifolia* originating from Tasmania – the Henty River catchment, 19.2 km from Strahan.

New and planned plantings using Tasmanian species will strengthen the Tasmanian connection. Species on the list include ferns such as *Blechnum penna-marina* and *Dicksonia antarctica*. *Muehlenbeckia gunnii*, will be planted to climb its way up and through the treehouse.

The intention of the design is to enhance the link between the plants and the natural landscape. Careful placement of rocks and creek alignment connects the sections above the treehouse down through the lawn below. The lawn is made up of *Zoysia* spp, the first use of Australian turf in the Gardens.



JIM GOULD

At the opening of Paperbark Treehouse



PHOTO SUPPLIED BY THE DEPARTMENT OF THE ENVIRONMENT

Assistant Minister for the Environment, the Hon Melissa Price MP, opened the *Who Did That?* Children's Trail and explores the trail with children



Always welcomes Friends! with a 10% discount on purchases over \$10, including the purchase of gift vouchers, on production of the customer's membership card for the person whose name is on this card.

No discount on redemption of gift vouchers.

www.botanicalbookshop.com.au

Gardens Shorts

New librarian promotes botanical resources

At the end of last year, Jane Black commenced as our new Librarian and Archivist in the Library at the Gardens. Since her arrival, Jane has been out and about meeting with the various Friends groups including the Botanic Art Group, Photographic Group and the Guides to ensure that all are aware of the wonderful array of library resources which are available for their use. All Friends are reminded that they are welcome to join the Library which is open Monday to Friday, 9.30am to 4.30pm. For further details or to search the Library catalogue please visit www.anbg.gov.au/gardens/research/library/index.html



PHOTO SUPPLIED BY JANE BLACK

Jane Black, ANBG Librarian

What's happening in the Grassy Woodland Garden?

The Grassy Woodland Garden is getting some loving attention to provide better access and refresh the timber boardwalk. The boardwalk is being replaced and upgraded with fibre reinforced polymer (FRP) decking to match existing installations throughout the Gardens and so the section can remain open during frosty periods. A central metal rail will strengthen the boardwalk to the specification for the FRP decking. In addition, the concrete gutter

below the Grassy Woodland Garden and the crossing are being replaced to allow better access for prams, wheelchairs and pedestrians.



BARBARA PODGER

Grassy Woodland walkway upgrade

Botanical interns 2018

For seven weeks the annual Volunteer Botanical Training Program welcomed 10 participants to the Australian National Herbarium (ANH) and ANBG at the beginning of the year. Trainees this year came from across the country – WA, SA, Vic,

the ACT and NSW – and included a representative from the Gardens. Trainees participated in training sessions and workshops, attended botany lectures and ventured into the field with staff from the ANH. They achieved a huge amount of work ranging from the basic but vital tasks of putting specimens away in the collection and checking lists of incoming and outgoing material in Loans and Exchange to checking and correcting errors for the specimen imaging project, assisting with a slide donation to the Australian Plant Image Index and updating specimen names in line with recently published taxonomic revisions. They also found and extracted hundreds of voucher specimens for the seeds recently imaged by the Gardens' National Seed Bank. These have been imaged and will eventually be available alongside the seed images to the general public.



BRONWYN COLLINS

Rosella Hampshire with the 2018 Botanical Interns group

The Friends have supported the Volunteer Botanical Training Program for many years. The support from the Friends includes, among other benefits, a year's complimentary membership of the Friends, a copy of the latest *FronDS* and a \$100 gift voucher to be spent at the Botanical Bookshop. These gifts were presented to each trainee at their graduation ceremony on the 16 February 2018 on behalf of the Friends, by the treasurer, Helen Elliot.

Friends Briefs

Gardens of the high country at Nimmitabel

In October a bus load of Guides conference delegates headed down the Monaro Highway to Nimmitabel. Nimmitabel is more than a stop on the way to the coast with some interesting buildings such as the historic Geldmacher Mill and the 1863 Police Lock-up. However our goal was to visit three 'secret' farm gardens, courtesy of the Nimmitabel and District Garden Club (NDGC).

The sparsely populated Monaro plains sit 1000 metres above sea level with a low rainfall and cold winters. The

granite soils are heavily leached and infertile, with occasional more fertile patches of ancient basaltic bedrock. Against this harsh background our hosts had developed truly beautiful gardens.

The Monaro is a haven for many hardy exotic and native shrubs, trees, and perennials. However oaks, elms, lindens, conifers, snow gums, viminalis, osmanthus, spiraea, roses, peonies, aquilegias and viburnums thrive in the challenging conditions, as do hardy grey-leaved ground covers.

Alison Turner

For your own Monaro Plains garden experience, the NDGC will run their fundraising 'Autumn on Monaro' open gardens and plant fair on April 21 and 22 at 10am- 4pm. Enquires to Pat Nichols on 6454 6351. email killarna86@gmail.com Bookings preferred.



TRISH MUNIRO

Summer Sounds Success

The four-concert series of Summer Sounds enjoyed balmy weather and good crowds on the last weekend of January and the first weekend of February. Concerts featured excellent jazz music, fun dance lessons, dramatic drumming, a taste of Shakespeare, as well as delicious food, drinks and icecream.

The Friends were major contributors to the cost of presenting the concerts.

Our thanks to our wonderful volunteers who assisted with the collection of entry fees, welcoming visitors, directing parking, and driving the assistance vehicles, as well as staffing the Information Tent.

We also thank ICON Water for again sponsoring the concerts this year.



STEVE ROGERS



HELEN DAWES



CHRIS ROGERS



BRIAN MOIR

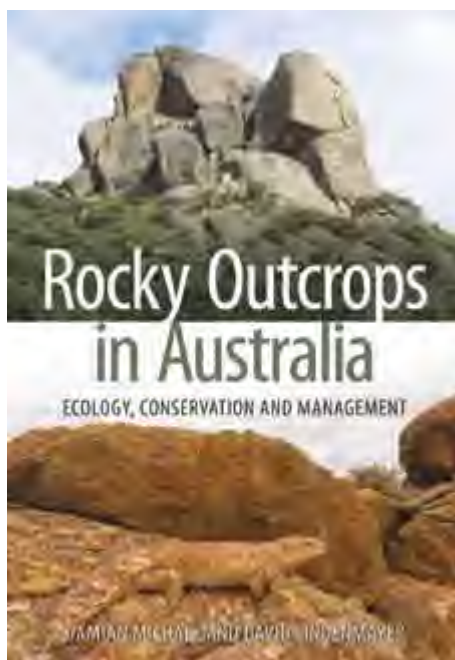
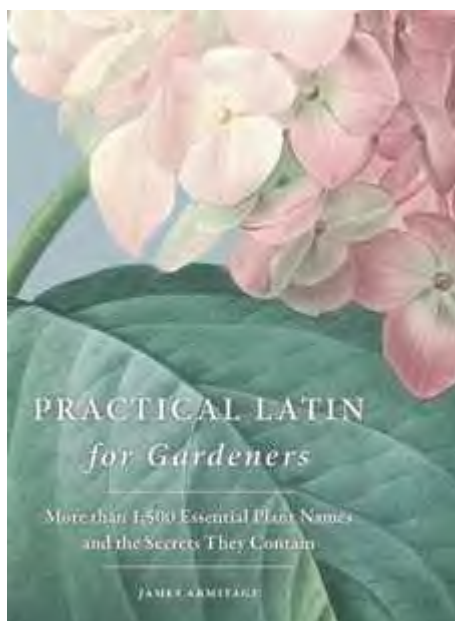
Practical Latin for Gardeners

2017, James Armitage, Soft cover, 160 pages, Colour illustrations, \$25.00

Aculeatus, capillipes, trigonophyllus, umbellatus, tasmanicus, muralis, glaucus, distortus... 'Pardon?' you may say... Well, these potential tongue twisters are just a few of the 1500 Latin names contained in this gorgeous book that will guide gardeners through the sometimes confusing world of plant names.

Practical Latin for Gardeners is a beautifully presented book, packed with colour illustrations and a useful introductory guide to naming plants. This book includes both definitions and pronunciations for each word, as well as a 15 page index, so that it can still be used as a conventional dictionary of Latin names. The book has been divided up into chapters that relate the Latin words to different categories including colours, flowers, shape, size, animals, places, and people.

Oh, by the way the definitions are... 'prickly, with slender feet, with triangular leaves, with umbels, connected with Tasmania, growing on walls, with a bloom on the leaves and misshapen'. Did you guess any correctly?



Rocky Outcrops in Australia – Ecology, Conservation and Management

2018, Damian Michael and David Lindenmayer, Soft cover, 176 pages, Colour photographs, \$49.95

Rocky Outcrops! Apart from being great fun to explore whilst out bushwalking, this book brings to life the amazing biodiversity values in and around these natural features: they support specialised plants and animals, and a wide variety of endemic species. To Indigenous Australians, they are sacred places and provide valuable resources. Despite their ecological and cultural importance, many rocky outcrops and associated biota are threatened by agricultural and recreational activities, forestry and mining operations, invasive weeds, altered fire regimes and climate change.

Authors Damian Michael and David Lindenmayer look at the importance of rocky outcrops and why this habitat is important to improve biodiversity conservation in agricultural landscapes, state forests and protected areas. Illustrated with stunning colour photographs, this book will provide a great reference for landholders, natural resource managers, Landcare groups and naturalists interested in Australian wildlife and these fascinating landscape features.

Paintings of Australian flora in worldwide synchronised exhibition

The first worldwide synchronised exhibition held by the botanical art societies of the world will be held on 18 May 2018 with events held for 24 hours, following the sun from venue to venue.

The Botanical Art Society of Australia is organising the Australian exhibition, to be held in Canberra. An exhibition of 140 botanical paintings of Australian plant species, including art works from members of the ANBG Botanic Art Groups, will open at the Ainslie Arts Centre (30 Elouera Street, Braddon) on 18 May. It runs from 10.00am to 4.00pm daily until 27 May.

Further information:

www.botanicalartsocietyaustralia.com www.botanicalartworldwide.info



Sue Stuart - *Richea dracophylla*

Details of events are correct at the time of printing. For changes and updates please check the Friends' website at www.friendsanbg.org.au or the Gardens' site at: www.anbg.gov.au

The Friends of the ANBG thank the many speakers who volunteer their time and talents to further the knowledge of all who attend the events in the Gardens. The Friends use the 'gold' coin donations received at each activity to support Gardens' programs and development. The Friends thank all those who have donated. Please note: unless otherwise indicated, talks are in the ANBG Theatre.

Some summaries or PowerPoint presentations of Thursday talks are available to Friends from the ANBG library. A donation to the Friends for the use of this material will be gratefully accepted.

Bush Magic Story Time for Pre-schoolers

First Friday of month, 10 – 11 am; \$5 per child; follow the signs from the Café bridge

Come along and enjoy the Gardens with specially themed stories and crafts.

Free Guided Walks

Daily at 11.00 am and 2.00 pm

Meet a volunteer guide at the Visitor Centre for a free one-hour tour of the Gardens.

Flora Explorer tours

Weekends & public holidays, 10.30 am & 1.30 pm. Purchase tickets from the bookshop. Tours cost \$8 for adults and \$5 for children and concessions. Children under 3 travel free.

Forty-five minutes of discovery around the Gardens

Weeding Black Mountain

Removing Woody Weeds from Black Mountain and ANBG Annexes

Check Friends website for meeting place of each weeding work party.

Please email your name and phone number to friendsofblackmountain@gmail.com or phone Linda (0437 298 711) or Libby (02 6296 1936) so there is enough delicious morning tea.

Saturday 7 April: 9:00 am – 12:00 noon

Saturday 5 May: 9:00 am – 12:00 noon

Saturday 2 June: 9:00 am – 12:00 noon

Saturday 7 July: 9:00 am – 12:00 noon

Growing Friends, Autumn Plant Sale

Saturday 7th April 8.30 – 11 am

Small carpark adjacent to the Crosbie Morrison Building.

A wide range of plants is available (over 90 different species), with compact types, ground covers, small shrubs, large shrubs and trees. Details of the sale including a list of the available plants will be on the Friends website one week prior to the sale. We have access to propagation material from the ANBG. You will be able to buy good quality plants, many of which you don't see in nurseries, at fantastic prices. Even better, the money raised from the sale goes to support the ANBG.

Jan Vincent Watercolour Workshop

**Saturday 7 April 9.30 am – 3.00 pm
Crosbie Morrison Building**

Cost \$120 per person

Join renowned artist Jan Vincent to discover how to capture the Gardens' beautiful flora and fauna through watercolour.

Jan has exhibited watercolours for more than 40 years. An experienced and inspirational teacher, she will share her love and respect for nature and its intrinsic beauty from tall trees to flowers to tiny ferns.

The class is for people over 16 years of age and caters for beginners as well as people with watercolour experience.

For more information or to enrol, please contact Jan directly:

Phone: 02 6278 5921

Email: janvincentartist@bigpond.com.au

Website: www.janvincent.net

Indigenous Plant Use Walk – Canberra and Region Heritage Festival event

**Wednesday 18 April 10.00 am – 11.00 am,
Saturday 21 April 10.00 am – 11.00 am
and 11.30 am – 12.30 pm. Free.**

Join a Ranger and enjoy an easy walk along our Aboriginal Plant Use Trail. Bookings essential: ANBG website

The Earth Festival

**Saturday 21 April and Sunday 22 April
10.00 am – 4.00 pm**

A Canberra Vegan Festival; an educational event based on environmental sustainability to raise awareness about everyday choices and how they impact the environment. Food, workshops and speakers. Cost applies. www.theearthfestival.org

Canberra Tree Week Symposium

Saturday 5 May and Sunday 6 May

Canberra Tree Week 2018 – ACT Tree Climbing Competition. (see ANBG website for details)

Introductory Photography Workshop

**Saturday 19 May 9.00 am – 4.00 pm;
\$150; Crosbie Morrison building**

A new all-day Photographic Workshop to be held for all Friends of the ANBG. If you want to understand your digital camera settings and improve your photography techniques then this may well be for you. The workshop will be run by the Friends of the ANBG Photographic Group.

The full day course will be conducted in two sessions both theory and practical. Places strictly limited. Contact photo@friendsanbg.org.au Book via Friends ANBG website.

What's on (contd.)

Rainforest Drawing Workshops

Saturday 12 May and Sunday 13 May
Banks Building

Cost \$220 per person | \$187 Friends/
concession/group. Join contemporary
artist Genevieve Swifte under the
rainforest canopy in this immersive
landscape course.

Contact: mail@genevieveswifte.com

BGANZ Botanic Gardens Day

Sunday 27 May.

Times to be confirmed: see ANBG
website

Walk in the Rainforest with Toby Golson

7 June or 21 June at 10 am

Join Toby on a walk in the Rainforest to
see and hear about the new plantings
from material collected on his field trip
in 2014. This trip and one in November
2017 were supported by the Friends
and Toby is keen to share the results.
Numbers are limited, and bookings can
be made via the Friends website under
Calendar.

EXHIBITIONS

Visitor Centre Gallery, Open Daily 9.30 am – 4.30 pm, FREE

BOTANIC ART EXHIBITION – THREATENED AND ENDANGERED SPECIES. UNTIL 15 APRIL

An exhibition of botanical art representing Australian flora by the Friends of the Gardens Botanic Art Groups. Features representations of threatened and endangered species.

AWAKENING TO BEAUTY 19 APRIL TO 18 MAY.

A collection of photos by Tina Hollis to awaken people to the beauty of Australian flora, birds and scenery.

BOTANICAL INSPIRATIONS 24 MAY TO 16 JUNE

Paintings in oil, acrylic and watercolour inspired by the plants in the Gardens and showing the light and colour from the perspective of professional artist and teacher from the local region, Margaret Hadfield.

UNIQUELY AUSTRALIAN 19 JUN-2 JULY

Enjoy the beauty and diversity of Australian native flora as portrayed by porcelain artists from the ACT Porcelain Artists Association.

NAIDOC EXHIBITION 5 JULY – 29 JULY

An exhibition to the theme 'Because of her we can'

RESONANCE 1 AUGUST– 8 SEPTEMBER

An exhibition of watercolour paintings and drawings by the Painting with Parkinsons group, an Art Therapy Program working with those who have Parkinsons disease and their carers.

Autumn Renewal

Light breeze, colourful leaves, bare trees. Autumn's here!

Don't let yourself be brought down by the cooler weather. Invigorate your body and soul with our Autumn Renewal special! Scrub Summer away with our Macadamia Body Polish before indulging in our Renewal Facial and Bright Eyes

Renewal for
just \$189 (save \$40!)

jindii.

The Franklin Building
Australian National Botanic Gardens
Acton ACT 2601
T: 02 6257 8777
E: relax@jindii.com.au

Jindii Eco Spa's Sunday Sessions

Jindii's community wellness and education initiative allows people to come and connect with one another and learn new things. Monies raised support the Indigenous Literacy Foundation. Information and tickets on 'Events' at www.jindii.com.au

Living Mindfully Series

Join us at Jindii Eco Spa with Mindfulness teacher, Jacqui Shannon, who will guide you through different mindfulness practices and their application to different life challenges. More information & tickets on 'Events' at www.jindii.com.au



P. ROONEY

'Alarm calls and eavesdropping in wild bird populations' Thursday Talks, 31 May

Thursday Talks: April – August 2018

Lunchtime talks are held at 12.30 pm every Thursday from February to November in the Gardens' Theatrette. Talks last for 1 hour. Admission is by gold coin donation. There is no need to book but please note, that for safety reasons the ANBG Theatrette seating is strictly limited to 90 people. So, do come early for a seat at a Thursday Talk.

Please direct queries about Thursday Talks to Doug Laing, email lilley@iimetro.com.au

April

Thursday 5 April 12.30 pm

Lynne Bean 'What is to be found in the Talbragar Fossil Fish Bed?'

Lynne will talk on the fossil fish and plants from the Talbragar Fossil Fish Bed, NSW, which date from the Upper Jurassic, she will also briefly mention insects.

Thursday 12 April 12.30 pm

Dr Rosemary Purdie 'Immersed in the Larapinta' (repeat)

Rosemary will talk about her Larapinta Trail walk – end to end - in July 2017, and the plants and stunning landscape en route.

Thursday 19 April 12.30 pm

Dr Leo Joseph 'News from the Front: An update on bird research at the Australian National Wildlife Collection (ANWC) and around the world'

This talk will be about thorny taxonomic problems in our birds, such as the Chestnut Quail-thrush, White-eared Honeyeater, and natural selection starring the Eastern Yellow Robin.

Thursday 26 April 12.30 pm

Dr John Bradshaw 'Rocks, climate change and trees'

John will assemble an eclectic mix of his recent adventures, including working on technical climate change solutions in his profession as a geologist, mixed with his passion for the natural environment, native plants and trees.

May

Thursday 3 May 12.30 pm

Associate Professor Mark Lintermans 'Stairway to heaven or highway to hell: the road for threatened freshwater fish recovery in Australia'

The focus will be on the Murrumbidgee & Cotter catchments and the suite of threatened fish species that live there including Macquarie perch, trout cod, two spined blackfish and Murray River crayfish.

Thursday 10 May 12.30 pm

Dr Brian Cooke 'Effects of pastoralism and rabbits on the economy and culture of the Diyari People in north-east South Australia'

Brian, a retired CSIRO scientist, considers how European rabbits damaged not only agriculture and the environment but might have also destroyed the economy and culture of Aboriginal people so closely associated with the plants and animals that sustained them. Information from explorers' journals and Lutheran missionaries in north-eastern South Australia provide new insights.



Thursday 17 May 12.30 pm

Dr Lizzie Wandrag 'The impact of bird loss on tropical forests: a case study from Guam'

Lizzie, a Postdoctoral Fellow at the University of Canberra, will illustrate how the introduction of the brown tree snake has wiped out the entire avifauna of the Pacific island of Guam. The talk will explore what this means for forests on the island, and will compare what is happening on Guam with adjacent islands.

Thursday 24 May 12.30 pm

Jason Mundy 'Australian Marine Parks: The world's largest representative network'

Jason, Assistant Secretary of the Marine Protected Areas Branch of Parks Australia, will focus on recent developments in the creation of new management plans for 44 marine parks around Australia and steps to implement them.

Thursday 31 May 12.30 pm

Professor Robert Magrath 'Alarm calls and eavesdropping in wild bird populations'

Robert, from the ANU, will discuss how many birds give alarm calls to warn members of their own species about danger, but other species often listen in on these calls. The talk will provide an overview of work focusing on common birds living in the Botanic Gardens.

June

Thursday 7 June 12.30 pm

Dr Ann Moyal 'Robert Brown in Australia'

Ann is a historian of Australian science and will talk on Robert Brown who spent nearly four years in 'New Holland' from 1801-04. He gathered an immense collection of plants that laid the foundation of Australian botanical knowledge, and revitalised botanical science internationally.

Thursday 14 June 12.30 pm

Max Bourke 'Kipos or paradeisos?'

Max, an agricultural scientist and inveterate volunteer, will illustrate how dry gardens of Greek Islands have given us a legacy of valuable foods but also some invasive species. This talk is based on a two week visit to well and lesser known islands.

Thursday 21 June 12.30 pm

Dr Ceridwen (Crid) Fraser 'Dispersal and disturbance shape global patterns of biodiversity'

Crid, a biologist/phylogeographer at the ANU will give an overview of how dispersal and disturbance interact to structure spatial patterns of biodiversity and will focus on research on diverse Southern Hemisphere systems including shallow water marine communities in the sub-Antarctic.

Thursday 28 June 12.30 pm

**Honorary Professor Penny Olsen
'Indigenous Australians early
contributions to zoology'**

It is well known that indigenous Australians often acted as guides to European expeditions. But they also played a vital role in the scientific discovery and description of the continent's unusual flora and fauna and understanding of its biology and ecology.

July

Thursday 5 July 12.30 pm

**Brett McNamara 'The art of
community engagement in our parks'**

Brett, Manager of Namadgi National Park, looks at more than ten years of artist and craft practitioners immersing themselves in the heart of the Park and drawing inspiration from their surroundings.

Thursday 12 July 12.30 pm

**Dr Linda Broome 'Relationships
between the endangered Mountain
Pygmy-possum, snow, moths and
changing climate'**

Linda has been monitoring populations and undertaking research on the Mountain Pygmy-possum for over 30 years.



Thursday 19 July 12.30 pm

Peter Byron 'Canberra going tropical?'

Peter, General Manager of the ANBG, will talk about the new conservatory which will establish the Gardens as the leading conservator of Australian native tropical flora from areas such as Christmas Island, Kadadu and northern Queensland.

Thursday 26 July 12.30 pm

Scott Saddler 'From the ashes'

Scott is the Executive Manager of the National Arboretum. Following the 2003 bushfire the government decided to replace the pine plantations with a new National Arboretum which today provides a rich tapestry of patterns formed by the forest plantings in this world class facility.

August

Thursday 2 August 12.30 pm

**Nerilie Abram 'Australia's changing
climate from the perspective of the
past millennium'**

Nerilie, a Future Fellow at the ANU, will discuss ways in which evidence can be unlocked from natural archives, such as corals and ice cores, to understand how different climate factors that impact Australian rainfall have evolved and interacted over the past millennium.

Thursday 9 August 12.30 pm

Dr Don Fletcher 'Goannas in the ACT'

Since retiring from various roles as a land manager with the ACT Government, Don has investigated the ACT's two goanna species. This talk will reveal what a research team funded and run by local volunteers, with in-kind support from the ACT Government, has been attempting to learn about the goannas of Namadgi National Park.

Thursday 16 August 12.30 pm

**Professor Emeritus Patrick de Deckker
'Implications for your health, that of
the environment and climate change'**

Patrick from the ANU will talk about ubiquitous airborne dust. Where does it come from and where does it go, and have dust concentrations changed through time? He will try to answer these questions by taking you on a fascinating dust collecting trip to many parts of Australia.

Thursday 23 August 12.30 pm

**Doug Laing 'The Apothecary's garden -
a gem in London's heart'**

Doug, chair of the Thursday Talks Committee, will trace the history of the Chelsea Physic Garden in London - a tiny garden that has left an indelible mark on modern pharmacology and medicine.

Thursday 30 August 12.30 pm

**Julie Ryder 'Nature as muse: the
interaction between art and botany'**

Julie, Canberra textile designer and artist, will talk on the influences botany has had on her work. She uses natural dyeing, mordant printing, screen-printing and embroidery as language on cloth to tell narratives about place and people.

FRIENDS BENEFITS

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ANBG library membership -
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Assist with Gardens' research
projects
Become a Guide
Relax in the Friends Lounge
in the Ellis Rowan Building,
open to members 9.30am to
4.30pm. Relax with tea/coffee
and lots of interesting reading.

