



Newsletter

Australasian Systematic Botany Society

No. 187, June 2021



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July Conference
Have you booked?

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Book reviews

Mushrooming, Seaweeds,
Botanical art, Plants for kids,
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Our beginning

Minutes of our first meeting
in 1973!

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From the President

Mike Bayly

For many of us here in Melbourne, life has started to return to 'normal' in recent months. For me, it has been great to be back on campus and to interact more regularly with students and colleagues from both MELU and MEL. I'm even on the cusp of doing some interstate fieldwork, which seemed unimaginable just a few months ago. I hope that such normality in Australia and NZ will hold, at least mostly, but am looking with horror at the raging pandemic in other parts of the world and hope it can be curbed in good time.

Since the last Newsletter, the ASBS Council has met about monthly via Zoom. We have continued to work on regular society business, including student grants (see announcement by Heidi Meudt below in this issue), as well as planning for a new website (led by Kelly Shepherd), the impending conference and other initiatives that are bubbling along.

Upcoming conference

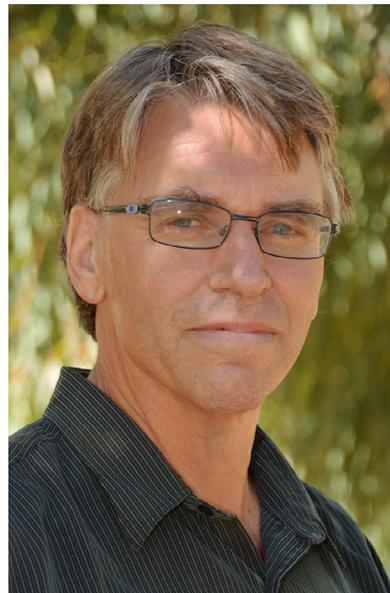
I'm looking forward to the upcoming conference, which will be a great focus for society activities. It is great to see that the website is now populated with information and that registration and abstract submissions are currently open. It will, of course, be an unusual meeting for us, adapting to an online environment, but I hope we will still get the sense of community and interaction that we normally associate with conferences, and I know the Organising Committee is doing their best to make it work.

Apart from the scientific program, there will be a good mix of keynote speakers, social events and society meetings/discussions. Because of the mid-year timing of the conference, the ASBS AGM will not coincide with the meeting; it will be held later in the year, when the audited financial statements

etc. have been prepared (details to be announced soon). We will, nonetheless, hold a session during the conference (Tuesday July 13), where we will provide an update on council activities and encourage discussion with members about society business. This will not be a formal General Meeting, largely because we missed the deadline, under clause 25 of the society's Rules, for giving four months' notice of the meeting, but we will run it with a similar intent to such a meeting.

Nancy Burbidge Medallist

It is my great pleasure to announce that Kevin Thiele is the latest recipient of the Nancy Burbidge Medal, our society's highest honour. Kevin will be well known to most of our members for his substantial contributions to research, teaching, innovation and lead-



ership in plant systematics. He has authored over 130 scientific papers and reports, and 80 plant names (mainly in Dilleniaceae, Proteaceae and Rhamnaceae) including 65 new taxa (three of them genera), and 17 new combinations. He has played key roles in the development of novel tools including LuclD, Keybase and the eFlora platform for Australia. From 2006 to 2015 he was Curator of the Western Australian Herbarium, leading the

institution through a period of growth and great change. During that time (2012–2014) he was also Chair of the Council of Heads of Australasian Herbaria and helped to drive significant development in key infrastructure such as the Atlas of Living Australia. More recently, he has played a crucial role in development of the Decadal Plan for Taxonomy and Systematics in Australia and New Zealand and, subsequently, as Director of Taxonomy Australia, which is entering the challenging and exciting phase of trying to implement that Plan. Sound science, visionary thinking, inspirational leadership and a good dose of unstinting determination are hallmarks of Kevin's substantial contributions.

The Medal will be presented to Kevin, in some form, as part of proceedings at the upcoming conference, where he will also deliver a Burbidge Lecture. That means we will have the pleasure of two Burbidge lectures at the meeting, with the other being given by 2020 Medal recipient Wendy Nelson.

Student 'travel' grants and conference support

Last year, ASBS received funds from the Department of Agriculture, Water and the Environment to offer travel grants for students attending conferences relevant to taxonomy and systematics, in lieu of the grants previously administered by ABRS. As a result of covid-related travel restrictions, and uncertainty about when they might be lifted, we did not offer any grants last year. Some of these funds, as well as society funds will be used to support student attendance at the upcoming ASBS conference, and details of how to apply for and obtain that assistance are available on the conference website. We are also in the process of identifying how these grants might also be offered for attendance at other relevant conferences, and hope to make an announcement about that soon, via email to members. Ongoing travel restrictions mean that most of these grants will likely cover conference registration fees, rather than travel costs. Although that is not

ideal, the current flurry of online conferences potentially allows more of our students to 'attend' international conferences than would ordinarily be possible.

Genomics for Australian Plants

As reported in the last Newsletter, the three main strands of the GAP program (reference genomes, phylogenomics, conservation genomics) are progressing well. Plans for stage 2 of the phylogenomics program are now getting underway and GAP is now calling for Requests for Partnership for that; the call is open until 30th June and details are available at <https://www.genomicsforaustralianplants.com/stage-2-aatol-rfp/>.

Workshops accompanying the upcoming ASBS conference (July 5–8), as part of the GAP initiative, will likely be of interest to those who are starting to grapple with the analysis and interpretation of large genomic datasets, whether through GAP or other research programs. The workshops will deal with bioinformatics pipelines for analysing target capture/target enrichment data of the kind used in the GAP phylogenomics program, and details are available at: <https://asbs2021.bablglobal.com/workshop/>. Also relevant to this are recent webinars, hosted by Australian Biocommons, including one by Anna Syme on chloroplast genome assembly (<https://www.youtube.com/watch?v=Z4x-90JraT-4>), Alexander Schmidt-Lebuhn on conflict in multi-gene datasets (<https://www.biocommons.org.au/events/conflict-multi-gene-datasets>), and Lars Nauheimer on detection of and phasing of hybrid accessions in a target capture datasets (<https://www.biocommons.org.au/events/hybphaser>); these are available on the BioCommons YouTube channel if you missed them and would like to catch up (<https://www.youtube.com/AustralianBioCommons>).

Mike Bayly (email: president.asbs@gmail.com)

Biodiverse Futures - Systematics in a Changing World



Registrants and prospective registrants

We are excited to introduce our ASBS conference platform powered through Babl, which creates a virtual event that provides plenty of opportunities for real-time, face-to-face interactions and which makes virtual networking feel natural and fun.

Features of our conference space include:

- **Easy to join and connect:** No need to pre-install special software. All you will need is your desktop computer or laptop to join via your browser.
- **Our networking space:** Here you can move freely from table to table to meet each other via mini video conferences. Tables in the networking space come in different sizes, from 2 to 8 chairs, so that you can mix up your conversations and meetings.

Would you like to host a round-table discussion or a satellite meeting?

Contact us to book your tables now:

[http://asbs2021@gmail.com](mailto:asbs2021@gmail.com)

- **Our broadcasting space:** The scientific sessions will be held in our broadcasting space via webcast with extended functionalities, such as live interactive Q&A, where you can ask your questions by joining the stage with your camera and

microphone, or anytime via the chat function.

- **Talks:** We ask our speakers to give live presentations where possible to allow live interaction with the audience. For speakers in distant time zones we offer the option to pre-record talks. All talks will be available for you to watch anytime for 30 days after the conference.
- **Poster sessions:** Poster sessions will be held in the networking space where each poster will be presented at one of the tables via screenshare. Participants can view posters and meet the poster presenter by simply joining the table. Other digital formats, such as short videos and animations, are also invited for the poster sessions.

The broadcasting space is seamlessly connected with the networking space through an integrated system. Shortly before the talks begin, you will be notified that the networking space is about to be switched to the broadcasting space to give you time to wrap up your conversations.

Visit our exhibitors and sponsors: Exhibitor and sponsor booths can be visited throughout the event and provide the opportunity to engage directly with exhibitors and sponsors.

The Australasian Systematic Botany Conference will be held virtually from 12–16 July 2021. Find out more:

<https://asbs2021.bablglobal.com>

Register now to join the conference.

<https://asbs2021.bablglobal.com/tickets/>.

**EARLY BIRD REGISTRATIONS AND
ABSTRACT SUBMISSIONS HAVE BEEN
EXTENDED TO 13 JUNE 2021.**

Your conference organisers,

Katharina Nargar (Chair), Frank Zich, Darren Crayn, John Clarkson and Ashley Field

ASBS Eichler Funding News

Heidi Meudt

ASBS Vice-President and Chair, ex officio, of the Hansjörg Eichler Research Committee

The March 2021 round of the ASBS Hansjörg Eichler Scientific Research Grants was extremely competitive, with six high-quality applications submitted. This was the second round in a row that we received six applications! It is great that we continue to see so many applying for these grants. The ASBS Research Committee has now reviewed all the applications and are pleased to announce the latest recipients:

- Francis Nge, postdoctoral researcher, The University of Adelaide, for the project, 'Systematics, evolution, and diversification of *Isopogon*–*Petrophile* (Proteaceae) and allies'; collaborators: Prof. Michelle Waycott, Dr Kevin Thiele.
- Miriam Slodownik, PhD student, The University of Adelaide, for the project, 'Environments and adaptations of Tasmanian fossil plant survivors (52 mya) after the end-Cretaceous mass extinction - Chapter 2: Connecting the Mesozoic and Cenozoic fossil records of Gondwanan south polar floras'; supervisor: Prof. R.S. Hill.

A full list of the Hansjörg Eichler Research Fund grant recipients (1997–present) can be seen here: <http://www.asbs.org.au/asbs/hesrfund/index.html>. This page also has additional links to the resulting reports from most of the previous winners.

Eichler application deadlines

A reminder that there are two more Eichler deadlines coming up this year:

Marlies Eichler Postdoctoral Fellowship

Applications close on 31st July 2021

We invite applications from members

Hansjörg Eichler Scientific Research Fund

Round 2 applications close on 14th September 2021

For eligibility, other information and the application form, see the ASBS website

<http://www.asbs.org.au/asbs/research-funds/index.html>

or contact Vice-President Heidi Meudt (vicepres.asbs@gmail.com)

ABRS update: Flora, Bush Blitz news

ABRS Team abrs@environment.gov.au

Flora of Australia (FoA)

A combined meeting of the Floras of Australia Advisory and Working Groups met in April 2020 to discuss the eflora profiles platform, and Kevin Thiele presented a new flora platform model that he has built on a Wix website. A follow-up discussion with the Floras Working Group is being organised to discuss future directions. The ALA is currently updating the Profiles platform software and planning some new developments including to update the editor functionality and build an API (Application Programming Interface) to enable data extraction.

Recent Flora treatments include *Acalypha*, *Actinidiaceae*, *Adriana*, *Alchornea*, *Aleurites*, *Amperea*, *Baloghia*, *Bridelia*, *Decaspermum*, *Meryta*, *Metrosideros*, *Oxalidaceae*, *Petrorhagia*, *Primulaceae* genera of *Maesoideae* & *Myrsinoideae*, *Solandra*, *Triphasia*, *Ungeria* and revised editions of *Akaniaceae*, *Alnus*, *Alstroemeria*, *Citrus*, *Lepidium*, *Nicandra*, *Sarcomelicope*, *Wikstroemia* and numerous miscellaneous taxa.

David Meagher's treatment of *Bazzania* has been added to the *Bryophytes of Australia*. As the first liverwort treatment published, this marks a significant first step toward expanding the scope of the Flora's bryophyte treatments beyond mosses. A range of other bryophyte treatments are on the way including *Acromastigum*, *Plagiochilaceae*, *Radulaceae*, *Trichocoleaceae* and an updated *Bryaceae*.

Flora contributions

Please contact the ABRS (email address above) with any feedback on *Flora of Australia* and *Bryophytes of Australia* content or platform functionality. If you would like to contribute new taxon profiles or update existing descriptions, please get in touch.

This could include anything from adding complete treatments to adding profiles for taxa from your research papers. There is also much opportunity for updating and editing treatments loaded from the hard copy floras, including reconciling information with currently accepted taxonomic concepts and updating keys.

Staffing

Key contacts:

Zoe Knapp, ABRS Manager

Endymion Cooper, *Bryophytes of Australia* treatments and Flora platform issues

Phillip Kodela, Flora of Australia treatments

Bush Blitz news

Bush Blitz has had a successful year with the Stoney Head Bush Blitz at the military training area in Tasmania completed in March. The Groote Eylandt Bush Blitz in the Northern Territory will run from 14–25 June, and a 45-day marine Blitz held in partnership with Museums Victoria and Parks Australia (Marine & Island Parks Branch) will leave from Darwin on 27 June; surveying the waters around Christmas Island on the RV *Investigator*. A combined terrestrial and marine Bush Blitz will also be held in the Fowlers Bay/Yalata region of South Australia in November.

Expressions of interest for Bush Blitz research funding have now closed and will be considered over the coming weeks.

Grants

The 2021–22 National Taxonomy Research Grant Program (NTRGP) round closed on 18 December 2020. Grant agreements are now being negotiated. A list of the successful grants will be published online at: www.environment.gov.au/science/abrs/grants/awarded.

Genomics for Australian Plants update

Lalita Simpson GAP Research Community Project Manager – Australian Tropical Herbarium and James Cook University

Mabel Lum GAP Project Manager – Bioplatforms Australia

Darren Crayn GAP Phylogenomics Lead – Australian Tropical Herbarium and James Cook University

David Cantrill GAP Lead – Royal Botanic Gardens Victoria

www.genomicsforaustralianplants.com @PlantsAus

The Genomics for Australian Plants (GAP) Initiative is developing genomic resources and expertise to enhance our understanding of the evolution of Australia's unique flora and support its management. GAP was initiated by Bioplatforms Australia in partnership with the Australian state and national herbaria and botanic gardens. GAP has three project streams: reference genomes, phylogenomics, and conservation genomics, and offers training resources. Here, we present an update on progress in each of these streams since March 2021.

Reference genomes

The Reference genome stream <https://www.genomicsforaustralianplants.com/reference-genomes/> aims to sequence and assemble the genomes of representative Australian plant taxa. Data generation for the pilot project sequencing the genome of *Acacia pycnantha* (golden wattle) <https://www.genomicsforaustralianplants.com/acacia-pycnantha/>, *Telopea speciosissima* (waratah) <https://www.genomicsforaustralianplants.com/telopea-speciosissima/>, has been completed and contributing teams are continuing preparations on publications. Earlier this year Stephanie Chen presented a talk for the Royal Botanic Gardens Sydney's virtual science seminar series (<https://www.rbgsyd.nsw.gov.au/Science/Virtual-science-seminars>) on assembling the waratah reference genome. Stephanie's talk can

be viewed here: <https://www.rbgsyd.nsw.gov.au/Science/Virtual-science-seminars/The-waratah-genome>. A second phase for the reference genome stream initiated in 2020 is underway. Sample preparation is ongoing and sequencing has been carried out for *Eremophila drummondii* <https://www.genomicsforaustralianplants.com/eremophila-drummondii/>, *Phebalium stellatum* <https://www.genomicsforaustralianplants.com/phebalium-stellatum/>, *Wahlenbergia ceracea* <https://www.genomicsforaustralianplants.com/wahlenbergia-ceracea/> and *Xanthorrhoea australis* <https://www.genomicsforaustralianplants.com/xanthorrhoea-johnsonii/>. A request for partnership call is now open for the third phase in the reference genome stream and will close June 30. This phase aims at filling in global gaps in genome coverage across the Angiosperm Tree of Life. We strongly encourage all who may be interested to consider making a submission. For more details, please visit the GAP genomes – request for partnership 2021 page <https://www.genomicsforaustralianplants.com/reference-genomes-rfp-2021/>.

Phylogenomics - Australian Angiosperm Tree of Life (AAToL)

In Stage 1, the GAP phylogenomics project <https://www.genomicsforaustralianplants.com/phylogenomics/> aims to reconstruct a genus-level Australian Angiosperm Tree of Life, by sequencing more than 95% of the

nearly 2,100 native Australian angiosperm genera for 353 low copy nuclear genes using the Angiosperms353 target capture nuclear bait kit (<https://academic.oup.com/sysbio/article/68/4/594/5237557>). Stage 1 of the project has been undertaken in partnership with Plant and Fungal Tree of Life project (PAFTOL) (<https://www.kew.org/science/our-science/projects/plant-and-fungal-trees-of-life>) that is working towards reconstructing a genus-level phylogeny of the world's angiosperms using the Angiosperms353 kit. Data generation for the GAP phylogenomics AAToL stage 1 is nearing completion. In total 1,386 samples were submitted for processing by the Australian Genome Research Facility. Sequencing has been completed for 83% of these samples and processing of the sequence reads, phylogenetic analysis and publication planning is underway. It has been an incredible achievement to have progressed this ambitious project during the pandemic and a huge thank you goes out to the many researchers who collected and prepared samples. We are planning a series of talks for the ASBS2021 virtual conference on the project outcomes so far. Through our collaboration with PAFTOL we are on track to meet our aim of 95% coverage of the Australian angiosperm flora at the genus level. After developing a complementary sampling strategy to maximise coverage across the two projects, an exciting stage of data exchange is now underway. So far, 545 PAFTOL samples have been provided for inclusion in the AAToL project, 750 GAP samples have been provided reciprocally for inclusion in the PAFTOL project, and further exchanges are scheduled as data become available. Collaborations have also been established with PAFTOL researchers and other international collaborators focused on taxonomic groups including Asteraceae, Fabaceae, Magnoliids, Orchidaceae and Poaceae. Our PAFTOL collaborators have recently reached a major milestone with the publication of their marker paper 'A comprehensive phylogenomic platform for exploring the Angiosperm Tree of life' (<https://academic.oup.com/sysbio/advance-article/doi/10.1093/>

[sysbio/syab035/6275244?searchresult=1](https://academic.oup.com/sysbio/advance-article/doi/10.1093/sysbio/syab035/6275244?searchresult=1)) in Systematic Biology, including a major data release through their purpose-built KEW Tree of Life Explorer (<https://treeoflife.kew.org>). A Request for Partnership call is now open for the GAP Phylogenomics AAToL stage 2 and will close 30 June. AAToL stage 2 aims to fill the tips of the Australian Angiosperm Tree of Life through production of datasets with denser sampling within genera to address questions of monophyly, evolution, and biogeography. We strongly encourage all who may be interested to consider making a submission. For more details, please visit the AAToL stage 2 request for partnership page (<https://www.genomicsforaustralianplants.com/stage-2-aatol-rfp/>).

Conservation genomics

The Conservation genomics (<https://www.genomicsforaustralianplants.com/conservation-genomics/>) stream aims to provide genomic information to support conservation of the Australian flora and focuses on the resolution of species complexes consisting of suspected conservation dependent species. Conservation genomics projects were initiated in 2020 utilising the genotyping by sequencing (GBS) approach selected for its ability to distinguish genetic variants among closely related individuals, for example within species complexes. Data generation is complete for two projects: *Geleznovia verrucosa* (<https://www.genomicsforaustralianplants.com/geleznovia-verrucosa-conservation/>) and the *Wurmbea dioica* subsp. *alba* complex (<https://www.genomicsforaustralianplants.com/wurmbea-dioica-conservation/>). Sample processing is underway for a further three projects: *Synaphea stenoloba* (<https://www.genomicsforaustralianplants.com/synaphea-stenoloba-conservation/>), *Isopogon buxifolius* (<https://www.genomicsforaustralianplants.com/isopogon-buxifolius-conservation/>) and *Cassia* species (<https://www.genomicsforaustralianplants.com/cassia-conservation/>). Sample collection and preparation are ongoing for seven remaining projects. Several projects have faced challenges meeting requirements for the high-quality

DNA required for the GBS method, and additional field work to collect fresh samples is being undertaken in the endeavour to meet these requirements. Some lessons learned to date on the type of samples that will yield the high-quality DNA required for the GBS method include: herbarium samples are not suitable for GBS, older silica dried samples are 'probably' not suitable to GBS (some might be depending on the age of the sample and how fast it was dried) and, new silica-dried samples and fresh samples are suitable for GBS.

Bioinformatics training

To analyse the GAP phylogenomics datasets, the GAP bioinformatics working group has combined newly developed and existing scripts into an integrated workflow for the assembly of target capture data. The group is now offering both theoretical webinars and hands-on training workshops on the use of this workflow. This series of bioinformatics

training events will be delivered virtually from 5–8 July in collaboration with the Australian BioCommons (<https://www.biocommons.org.au>), in conjunction with the virtual ASBS 2021 conference. For more details, please visit the ASBS 2021 workshop page (<https://asbs2021.bablglobal.com/workshop/>).

Acknowledgements

We would like to acknowledge the contribution of the Genomics for Australian Plants Framework Initiative consortium (<https://www.genomicsforaustralianplants.com/consortium/>). The Initiative is supported by funding from Bioplatforms Australia (enabled by NCRIS), the Ian Potter Foundation, Royal Botanic Gardens Victoria, Royal Botanic Gardens Foundation (Victoria), Royal Botanic Gardens Sydney, Department of Biodiversity, Conservation and Attractions, Western Australia, CSIRO, Centre for Australian National Biodiversity Research and Council Heads of Australasian Herbaria.

Taxonomy Australia report

Kevin Thiele 25 May 2021

At the time of writing this report, an exciting milestone is just ahead for Taxonomy Australia. When you're reading it, that milestone will be just behind us (so you have the advantage over me).

The milestone is the launch of the advocacy campaign for a mission to discover and document all Australia's species in a generation. We've been working towards this since the release of the taxonomy and biosystematics decadal plan. An enormous amount of work has gone into thinking through the mission, discussing it, planning it, budgeting it, and figuring out how we can best advocate for it. June 4 is the advocacy launch date and the transition between the mission's planning and advocacy phases.

Of course, we are not yet at the doing

phase. A mission to discover and document all Australian species will be an enormous undertaking – it will be, quite simply, a generation-spanning project. It will require substantial direct resourcing and indirect support from governments, industry and the community. All that requires smart advocacy, and that's where we're at now.

You are almost certainly well aware of the idea of the mission. To recap, our best estimate is that, across the entire Australian biota (plants, animals, fungi and other organisms), only around 30% of all species have been discovered and taxonomically documented in the three centuries or so from the beginning of Western scientific exploration of Australia's biodiversity. We also estimate that, at current rate, it's likely to take another four centuries to complete the task – to have

a first-pass documentation of Australia's biodiversity. This is simply too long to wait.

You will also be well aware that funding for taxonomy in Australia (and throughout most of the world) is inadequate and dwindling. The question we've been pondering since the release of the decadal plan is how can we best square this circle – of inadequate resourcing, for a very large task, at a time of very great need for better knowledge of our biodiversity.

We believe that part of the reason for the inadequate funding is that we in the taxonomy and biosystematics fields have traditionally not been very smart about messaging. We are seen as a forever science (not as bad as, but equally problematic as, forever wars and forever chemicals) – at current rate we will be working away forever, with no clear end or goal in sight, slowly and painstakingly documenting bits of Australia's biodiversity but without a big picture to sell.

The mission to discover and document all Australian species in a generation is that big picture. It has a goal, it's time-bound, it's exciting and, we believe, it's sellable.

We also believe it's doable, as long as sufficient investment can be found. With all the modern tools at our disposal, from high-throughput genome sequencing to machine learning and supercomputing, the generation of taxonomists beginning their careers now have the best chance ever of doing what Linnaeus set out to do, with enthusiasm, chutzpah and naivety in equal measures, in the 18th Century – to document all of Earth's species.

An important asset for our advocacy is a report commissioned by Taxonomy Australia from Deloitte Access Economics (and very generously done pro bono by that company) which provides a preliminary cost-benefit analysis for the mission. The report estimates that the discovery and documentation of all remaining undiscovered in Australia will cost

\$824 million over 25 years, and the benefits are likely to be between \$3.7 billion and \$28.9 billion – a cost-benefit ratio of \$4–35 for every dollar of investment. The mission passes this preliminary test.

A word is needed about plants in the context of the mission. I said earlier that, across the biota, our estimate is that only 30% of Australian species have been discovered and named to date, and at least four centuries will be needed to achieve a first-pass complete documentation. For plants (and vertebrates), of course, the situation is substantially better. Vascular plants are probably around 90% discovered and named, non-vascular plants somewhat less so (the hyperdiverse fungi, of course, are at very low levels of discovery and documentation). An important part of the message for the mission is that we plan to discover and document all Australian species. While there will be substantially less species discovery involved with plants than with, for example, invertebrates and fungi, the documentation part of the mission is equally important. Finishing the *Flora of Australia* and Floras for all states and territories, dealing with all known phrase-named taxa, developing a complete DNA sequence library, diagnostics system and phylogeny for all known Australian plants, are all very much part of the documentation side of the mission. There remains much good work to do, and many powerful reasons to advocate for the funding needed to do it.

I said earlier that June 4 was the launch of the advocacy phase for the mission. The required advocacy will take time – no-one should be under any illusions that this will be an easy sell, or that governments will jump at the chance to fund this. Our advocacy for this needs to be long-term and strategic, and we will need to build a broad consortium of support. I believe all this is possible.

Importantly, we've been here before, and I believe this mounts a powerful argument against any naysayers who think this is all doomed to failure. Fifty years ago, a group

of strategic and visionary leaders in our community, including Nancy Burbidge, Selwyn Everist, Frank Fenner, David Ride, David Catcheside, Hansjörg Eichler and many others, working within the Australian herbaria and museums and with the Australian Academy of Science and the Australian New Zealand Association for the Advancement of Science (ANZAAS), were in a very similar position to ours today. Funding to document and understand Australia's biodiversity was minimal, there was little strategic coordination for large-scale biodiversity projects, and several decades of successive governments had shown little appetite to change this.

With canny, highly strategic, and sustained advocacy, this group turned all this around. In the lead-up to the crucial 1972 federal elec-

tion (the 'It's Time' election won by Gough Whitlam), a targeted and sustained advocacy campaign resulted in both political parties making pre-election commitments to fund a major Australian biodiversity and taxonomy initiative. The vision was realised after the election with the establishment of the Australian Biological Resources Study (ABRS). I think we all agree that ABRS has had an enormous and sustained impact over the ensuing 50 years. And, as an aside, the same strategic thinking and impetus from this advocacy campaign led to the formation of the Council of Heads of Australian (later Australasian) Herbaria, and the Australian (later Australasian) Systematic Botany Society.

Our community has done it before. Fifty years on, we believe it's time to do it again.

Herbarium News

Te Papa herbarium (WELT)

Heidi Meudt

Robert Brown Australian specimens held at WELT – images now available online

The Te Papa herbarium (WELT) holds 236 lots (352 sheets) of Robert Brown herbarium specimens collected as part of the Matthew Flinders expedition around Australia. Of the 236 lots, 69 (108 sheets) have some kind of type status. These numbers are a relatively small, but nonetheless significant, subset of the approximately 3,900 specimens Brown collected, with illustrator Ferdinand Bauer and gardener Peter Good, during the Flinders expedition.

At this point WELT is not certain when, or from where, we acquired these specimens, but investigations are ongoing. Recently, WELT volunteer Margo Montes de Oca, was tasked with imaging these specimens (Figs.

1, 2). Now, for the first time, they are accessible on Te Papa's Collections Online: <http://collections.tepapa.govt.nz/topic/11011>

Botany loans fly back to Australia

Recently, WELT returned 667 herbarium specimens of *Myosotis* (Boraginaceae) loaned from seven different Australian institutions (Fig. 3). Botany researcher Heidi Meudt spent many hours at the microscope measuring and observing these specimens, the results of which are now published in *Australian Systematic Botany* (Meudt et al. 2020).

Many thanks to the WELT Botany team, especially Kaitiaki Taonga (Collection Manager), Antony Kusabs and Technician Bridget Hatton for all their hard work in requesting, receiving, managing, annotating and returning these loans. Many thanks also to the staff

at the following herbaria for loaning WELT these specimens (in some cases for several years): AD, BRI, CANB, HO, MEL, NSW and PERTH.

iNaturalist City Nature Challenge 2021

The Te Papa Natural History team – including several WELT botanists – spent the afternoon of Friday 30 April participating in the iNaturalist City Nature Challenge 2021. <https://www.tepapa.govt.nz/learn/research/natural-history-research/natural-history-team> This is a global challenge where the aim is to find as many species as possible over a four-day period using iNaturalist. The Natural History team split up and went to two sites:

Ōtari Wilton’s Bush and the Ōwhiro Bay/Red Rocks area (Figs. 4, 5). Collectively, the team made 665 observations and recorded 354 species! You can see all the team’s observations here, and find out more about how our efforts contributed to Wellington’s results in this blog post: https://inaturalist.nz/observations?on=2021-04-30&&place_id=6803

Reference:

Meudt, H.M., Thorsen, M.J. & Prebble, J.M. (2020), Taxonomic revision of the *Myosotis australis* group (Boraginaceae) native to Australia, New Zealand and New Guinea. *Australian Systematic Botany* 33(6) 477–524. <https://www.publish.csiro.au/sb/sb20014>



Figure 1: *Pimelea flava* R.Br. subsp. *flava*, WELT SP095840, collected by Robert Brown. Image © Te Papa.



Figure 2: *Notothixos subaureus* Oliv., WELT SP095842, collected by Robert Brown. Image © Te Papa.

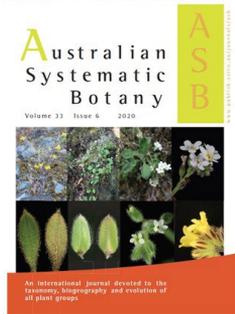


Figure 3: Top: Botany researcher Heidi Meudt (left) and Technician Bridget Hatton (right) with the 667 herbarium specimens being prepared for shipping; photo by Carlos Lehnebach. Bottom left: Dried, pressed forget-me-not herbarium specimen from WELT (*Myosotis saxatilis* SP105622). Image © Te Papa. Bottom right: The cover of *Australian Systematic Botany* featuring the published article and forget-me-not photos.

Figure 4: Antony Kusabs and Leon Perrie observe marine life in the hands of Andrew Stewart at Ōwhiro Bay/Red Rocks, Wellington, New Zealand during the iNaturalist City Nature Challenge 2021. Photo by Heidi Meudt © Te Papa.



Figure 5: Leon Perrie, Andrew Stewart, and Carl Struthers of the Te Papa Natural History team observe and document marine life at Ōwhiro Bay/Red Rocks, Wellington, New Zealand during the iNaturalist City Nature Challenge 2021. Photo by Heidi Meudt © Te Papa.

Western Australian Herbarium (PERTH)

Reconnecting and reimagining Herbaria: recognising the diversity of WA's herbarium volunteers and local floras during National Volunteer Week

Shelley A. James, Collections Manager



Fungal foraging the scientific way with Dr Elaine Davis. Photograph: Skye Coffey

The Regional Herbaria Network of Western Australia was established in the 1990s and by the 2000s involved more than 700 regional volunteers across WA. Today, while the network itself is no longer resourced, herbaria scattered across the State continue to be maintained and curated largely by passionate local volunteer groups. While many of the specimens within the Regional Herbaria are duplicated in the Western Australian Herbarium (PERTH), which houses the State's official botanical research collection, the Regional Herbaria often hold unique collections that represent the diversity of local native and weedy plant species. The Western Australian Herbarium relies heavily on volunteers

for the curation of specimens and images, and regional communities contribute significantly to the State's collections through volunteer and community science efforts and submissions for identification and incorporation. During National Volunteer Week, the Western Australian Herbarium, Department of Biodiversity, Conservation and Attractions (DBCA), hosted a celebratory event to thank volunteers for their efforts. The day brought together 60 enthusiastic volunteers and members of the Wildflower Society of Western Australia, volunteers based at the Regional Herbarium collections scattered from Esperance, across to Newdegate and Merredin, and up to Geraldton, and the dedicated volunteers based at the Western Australian Herbarium. It was a day to share experiences, learn new collections techniques, and inspire new volunteers to collect, document and learn about the floras and natural environments within their regions. Through a series of activities and facilities tours, staff at the Western Australian Herbarium provided basic training and skills to volunteers from the regional herbaria in current best practices for specimen collections, the legal requirements for collecting, and the identification, data gathering, and processing of botanical specimens. Talks by botanists John Huisman, Terry Macfarlane, Kelly Shepherd, Ryonen Butcher, and Elaine Davison were all enthusiastically attended! Bringing together like-minded herbarium volunteers, community scientists, and scientific staff for the day reconnected collections and people and provided new ideas and collaborations for the continued documentation of the rich flora of the very large State of W.A. Of course, it wouldn't be a celebra-

tion without a spot of lunch, sharing stories about the amazing diversity of the Western Australian flora and the people who strive to understand and protect it over a cup of tea and some home-baked cooking! The day was generously supported by the Wildflower Society of WA, Volunteering WA and Lotterywest.

Ben Anderson returns to Australia

Juliet Wege

Dr Ben Anderson has recently joined the team at the Western Australian Herbarium as a molecular taxonomist, charged with helping us to resolve some of the more taxonomically intractable elements of our flora. He will initially be working with Rachel Binks (DBCA) and Herbarium staff to resolve putative new rarities in Rutaceae, Proteaceae and Colchicaceae as part of the Genomics for Australian Plants (GAP) Conservation Genomics stream.

Ben completed his undergraduate studies at the University of British Columbia in Vancouver and a Masters degree at the Royal Botanic Garden Edinburgh before undertaking a PhD on the systematics of Australian hummock grasses (*Triodia*) at the University of Western Australia. For the past two years he has been conducting postdoctoral research on the mitochondrial genomics of parasitic plants in the Department of Ecology, Environment and Plant Sciences at Stockholm University.

Ben's return to Australia has been a lengthy and difficult process, given the current COVID travel restrictions, and so we are extremely relieved to see him arrive safe and sound. His molecular experience, not to mention his affable nature and youthful enthusiasm, will no doubt prove to be an asset.



Volunteers from WA's herbaria enjoying a tour and exploring the red boxes with John Huisman, Curator (PERTH); left to right – Sue Merritt (South West Regional Herbarium), Wendy Minchiin (Albany Regional Herbarium) and Beth Teale (Geraldton Regional Herbarium). Photograph: Karla Forrest

Murdoch University Herbarium (MURU)

Alex George

Murdoch University, South Street, Murdoch, W.A. 6150

Murdoch University was established in 1973 and a herbarium was started soon afterwards. Students and staff have made plant collections for various projects, mostly between the late 1970s and early 1990s. The herbarium is not databased and holds maybe 10,000 sheets of vascular plants, most from south-western W.A. Significant sets are from the university campus (which retains several areas of native vegetation), bushland remnants around the City of Melville (in which Murdoch is located), and riverine habitats along the Swan and Canning Rivers. Some are now of historical value, e.g. from an area in Queens Park (11 km ESE of central Perth), 1982, that is now covered with houses. We have good material from reserves farther afield on the Darling Plateau such as the Moondyne Reserve (east of Bullsbrook) and St Ronans Well (near York), others from Eneabba and the Fitzgerald River National Park. There are also collections from the Pilbara. There's a large set of Eucalyptus from south-western W.A., mostly collected by Ian Brooker in the 1980s, being duplicates from the then-CSIRO Division of Forest Research. We have a few collections from south-eastern Australia, especially Tasmania.

There is a large holding of marine algae from various localities along the Western Australian coast, most collected by Mike Borowitzka, John Huisman and Roberta Cowan. There is a small holding of fungi.

Currently the herbarium has no staff, being managed on a part-time, voluntary basis by Phil Ladd (p.ladd@murdoch.edu.au) and Alex George (a.george@murdoch.edu.au). We are unable to provide loans but visitors are welcome (by prior arrangement to ensure that one of us can be there).

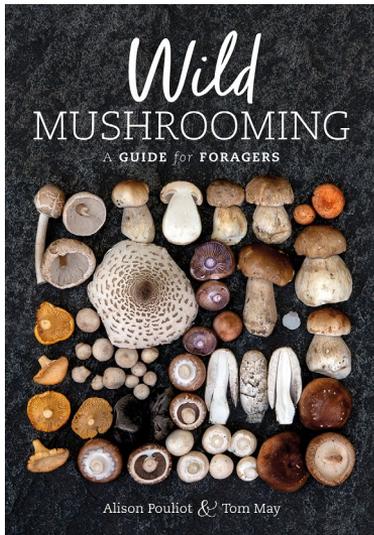


The Murdoch University Herbarium. Photo: Alex George

Book Reviews

An Australian Fungi Forager's Guide with Caveats!

Book review by Frances Guard



Wild Mushrooming - A Guide for Foragers

Alison Pouliot and Tom May

ISBN: 9781 86311736 (soft cover)

245 x 170 mm

CSIRO Publishing, 2021, pp 320

RRP AU\$49.99

This is the first forager's guide written in Australia by mycologists for those who would like to forage in the wild for their own edible mushrooms. It is not a quick 'identify and pick' manual. Rather, it is a careful, warning-filled document, illustrating and describing not only some ten edible native and exotic mushrooms found in Australia, but also many of their toxic, non-edible look-alikes. A whole chapter is dedicated to poisonous fungi, and one is left in no doubt as to their potential deadly effects. In one chapter profiling 10 edible fungi, the non-edible look-alikes (captioned with skull and cross-bones) are also

carefully described and illustrated.

However, this book is much more than a guide for mycophagists. It starts with a look at the kingdom of fungi, their physiology and roles in the environment, their morpho-groups and major identifying features. These are beautifully illustrated. It contains words of advice on how and where to find and collect fungi legally, and how to balance this with conservation needs.

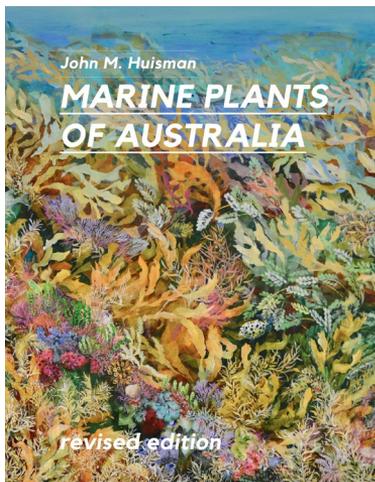
The final chapter is on fungi in the kitchen—storage, preparation and cooking of mushrooms, including some delicious recipes, which I have yet to try!

I found the book easy to read and full of useful information for both novice fungi collectors and more experienced field mycologists. It is a book I have dipped into several times while trying to identify some of the many *Agaricus* species that grow in my area. I will continue to use it as I try some of the recipes, and as a beautiful resource in training new amateur field mycologists.

I believe it will be a valuable addition to the small, but growing library of Australian fungi guides.

Seaweeds to grace your coffee table

Book review by Gerald T. Kraft



Marine Plants of Australia (revised edition)

John M. Huisman

ISBN: 978-1-76080-033-8 (soft cover)

xviii + 435 pp.

UWA Publishing, Crawley, W.A. 2019

RRP AU\$55.00

In the year 2000, John Huisman produced *Marine Plants of Australia*, arguably the first scientifically rigorous 'coffee-table' book devoted to a broad region's seaweed flora. 'Scientific' owing to the accuracy and detail of its descriptions, 'coffee-table' because of its large format and wealth of beautiful drawings along with underwater photographs of species taken in their natural habitats. Its emphasis, despite the all-embracing title, concentrated on the wealth of temperate Western Australian species, although several were also common across the greater extent of the whole of southern Australia. With just one print run by the University of Western Australia Press, supplies of this gem were quickly snapped up and soon exhausted.

For the following two decades, while he concentrated on purely technical morpho- and molecular taxonomic research, John con-

tinued to amass superb underwater photos from around the continent, always with the goal in mind of one day expanding and revising the coverage of his first edition. John also called on some talented friends (Graham Edgar, Mike Guiry, and Mike van Keulen) to provide images that he was unable to take himself, although less than 50 of this book's close to 750 photographs were not taken by John. This labour of love was well worth the wait, for we now have the 2019 Revised Edition. It is now a privilege to extol the outcomes of his generation-long endeavours.

Some years ago, a renowned algal physiologist wrote a book review in which he claimed that some of his 'best friends still press [algae],' the operative although unaccented word being 'still'. While no one doubted that his statement was true, the implication seemed to be that although it might be a harmless enough diversion (exercise in 'stamp collecting?'), such activity did not really qualify as doing much science in this day and age (it was 1972) of quantitative measurement, physio-chemical analyses, and the generation of testable hypotheses.

And yet, the pressing of algae that John is a practitioner of to this day, is surely the soul and handmaiden of many useful and productive scientific activities, including taxonomy and the vouchering of ecological, biochemical, physiological, and agronomic published research. I would not be the first to modestly point out to people who collect and press flowering plants, for example, that in most cases a careful press of an intricately patterned macroalga actually improves its appearance and its utility as a guide to the naming of things, whereas a fresh flower is manifestly superior to one that has been dried and pressed. When we see flowers illustrated in catalogues, guidebooks, and scientific publications, they are most frequently shown (apart from old type material) in the living state and/or growing in natural habitats. Such is the model for John Huisman's books.

Although there have been works with beautiful colour illustrations of seaweed specimens since the days of Turner (1808, 1809, 1811, 1819) and Harvey (1858–1863), all depicting plants as the artists imagined they would look if fresh, the fact is that most marine-algal illustrations over the past two centuries have been black-and-white pictures of dried herbarium specimens. There have, of course, been some fine exceptions to this generalization thanks to scuba diving phycologists such as the Littler and Littler team (2000, 2003), Edgar (2012), Nelson (2013), and Huisman himself (Huisman et al. 2007), who is now responsible for a product that conforms to what so many pure mathematicians apparently say about the highlights of their careers: results achieved that transcend even scientific rigor and excellence to enter the elevated realms of aesthetics and fine art.

The way John treats the over 600 species can be illustrated in just one example, picked from where the book randomly opened when I started writing. It is *Ptilophora prolifera* (p. 36), a bizarre Western Australian endemic of complex contours and consistently bonded surface layers of sponge. The centrepiece is a photo of a plant growing in its natural habitat and rendered in its living colour. Following a summary of its generic features (and along with type-locality and distribution information and references to 'Further Reading'), John reproduces the colour plate made by Australia's premier 19th century phycologist, the Irishman William H. Harvey (1862, plate 204), and then provides his own drawing of the microscopic details of critical vegetative features. John provides these hand-drawn illustrations for many of the species in the book, which might prompt the question 'How does he manage to make certain the cells look so realistically rounded, shaded and highlighted? Surely this must be the outcome of some sort of Photoshop program that automatically generates these impressive results.' And not just vegetative features; in many cases are highlighted very complicated critical reproductive structures that are so essential to the taxonomy of red algae, such as the egg

and early embryo structures of *Gloiostrichus* (p. 13), cystocarps of *Acrosymphyton taylorii* (p. 64) and *Seirospora orientalis* (p. 164), or the tetrasporangia of *Dudresnaya capricornica* (p. 78), *Anotrichium tenue* (p. 178) and *Spirocladia barodensis* (p. 241), to mention just a few. The answer is 'No, all these subtleties are achieved by hand through a process called "stippling."' This is an arcane, artistically and physically demanding technique, making one wonder 'How many dots of the Rotring pens did it take to produce these wonderful illustrations?' (It is a number beyond counting). John is a master of this art, producing originals suitable for framing.

As in the first edition, the new book has chapters on Cyanobacteria (as before also called 'The Blue- Green Algae') and the sea-grasses in addition to the red, brown, and green algae, thus covering the full range of macrophyte types. As expected, the largest section is devoted to the reds, and it is here that genera which may be unfamiliar to most of us are treated with photos supplied that show what their species actually look like, these new taxa being largely the result of recent alpha-taxonomic molecular studies. Examples include *Macrocarpus* (p. 20), *Titanophycus* (p. 22), *Aphanta* (p. 38), *Orthogonacladia* (p. 39), *Rhizolamellia* (p. 63), *Austrokallymenia* (p. 86), *Spongophloea* (p. 123), *Cryptocallis* (p. 126), *Incendia* (p. 133), *Perbella* (p. 148, a particularly spectacular habit photo), *Campylosaccion* (p. 152), and *Halopeltis* (p. 156). Even for practiced red-algal taxonomists, it will take some time to absorb all these changes and additions, and John's book will be a huge help in mastering them. And speaking of particularly spectacular photos, those of *Gibsmithia indopacifica* (p. 79) and *Martensia denticulata* (p. 195) are among many that should not be missed.

Although the genera of brown algae in the book will be familiar to most people, possibly with the exception of *Pseudochnoospora* (p. 263), *Lucasia* (p. 289), *Sargassopsis* (p. 308), and *Sirophysalis* (p. 313), the colour illustrations of these frequently large and impressive

species of browns are uniformly excellent. And although their genera are usually well known, the green algae are particularly photogenic, especially species of *Apjohnia* (p. 340), *Boergesenia* (p. 341), many *Caulerpa*, *Codium*, and *Halimeda* species, and particularly *Pedobesia* (p. 362), to name just a few.

As before, but in expanded form, introductory material covers the 'History of Marine Botany in Australia' as it developed from the 19th century and the even earlier beginnings of European marine-plant studies. Particular homage is paid to William Harvey, the first European seaweed specialist to actually set foot on Australian shores, and to Prof. Bryan Womersley, the recently deceased 'doyen' of Australian phycology whose six volumes of *The Marine Benthic Flora of Southern Australia* (Womersley 1984, 1987, 1994, 1996, 1998, 2003) are the authoritative works on its seaweeds, although they are meant more for use by specialists than by lay people. Ending the book are an excellent glossary and references to both classical and contemporary taxonomic works.

John's is indeed a 'coffee-table' book, in the sense that the term is often applied to artistic presentations of architectural and interior design, geographical splendours, portraiture, painting, sculpture, etc. By this, it is meant that such works are not limited to just regional interest but are meant to be appreciated universally. It is a big claim to make, but I do not hesitate to make it for the revised edition of *Marine Plants of Australia*.

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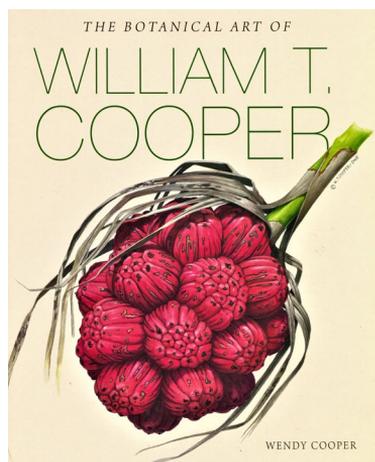
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This review is reproduced from the *Journal of Phycology* 56: 1373–1375 (2020). DOI: 10.1111/jpy.13008.

Not so cryptic painter of plants

Book review by John Clarkson



The Botanical Art of William T. Cooper

Wendy Cooper

ISBN: 97806422797712 (hardback)

290 × 240 mm

NLA Publishing, Canberra, 2021, pp. 324.

RRP AU\$65.00.

Despite his well-deserved reputation as one of the world's leading wildlife artists, W.T. (Bill) Cooper rarely ventured into painting plants, and never thought of himself as a botanical artist. Helen Hewson thought otherwise and was sufficiently impressed with his work to include it amongst contemporary artists like Celia Rosser, Elizabeth Conabere, Katrina Syme, Margaret Saul and Philippa Nikulinsky in her book *300 Years of Botanical illustration* (Hewson, 1999). In an obituary of Bill I wrote for this Newsletter in 2015 (Clarkson 2015), I pointed out that one of the things that set Bill apart from many other wildlife painters was the great attention he paid to getting the background just right. I suggested that if you could, just for a moment, avert your eyes from the creature, you could not possibly fail to appreciate the meticulous care taken to ensure the botani-

cal accuracy of every branch, leaf, flower or fruit. If the creature was removed, anyone who appreciates great botanical art would still have a splendid picture. Readers of this book will appreciate why this was so.

Drawing upon a veritable treasure trove of sketches, working drawings and diary notes, amassed by Bill over five decades, Bill's wife, Wendy, has provided readers of this lavishly illustrated book with a unique insight into Bill's artistic process. From many hundreds of sketches in Bill's archives, now held, for the most part, in the collections of the National Library of Australia and the State Library of New South Wales, Wendy has selected material for 145 species and grouped it into 5 chapters based on broad vegetation groups; Rainforest Trees and Shrubs (47 spp.); Vines, Ferns and Epiphytes (30 spp.); Dry Country (26 spp.); Swamps, Mangroves and Beach Forest (13 spp.); and Beyond Australia (29 spp.). Each chapter is introduced by a short essay by naturalist and close friend of Wendy and Bill, Rupert Russell.

Readers who are familiar with Bill's prodigious output of monographs and portfolios that began with *Parrots of the World* in 1973 and culminated in *Pigeons and Doves in Australia* in 2015 or with Penny Olsen's *The Life and Art of William T. Cooper*, would recognise some of the 60 plus full page or double page reproductions of completed paintings but readers are treated to a few that have not been published previously. Included amongst the 60 are five purely botanical paintings. Perhaps it is because I am so familiar with many of these, that I found myself immediately drawn to the partly finished, partly coloured works. These really show the artist at work and, even in the partly finished state, would be a welcome addition to any art collection. One such half-coloured plate, done for the watercolour painting of the Superb Fruit-Dove and reproduced in the biography of Bill published in this Newsletter in 2015, demonstrates this (see overleaf).

Readers should be aware of falling into a

common trap when faced with Cooper's paintings. Don't get distracted and concentrate solely on the paintings. Be sure to look elsewhere. In the text that accompanies each species, the author has provided all manner of interesting information such as where and why the material was collected, what attracted Bill to it in the first place, complemented, at times, with snippets from Bill's diaries.

This is a beautifully presented book. A wonderful addition to the legacy of W.T. Cooper and a book to be kept close by and dipped into often.

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Cissus hypoglauca

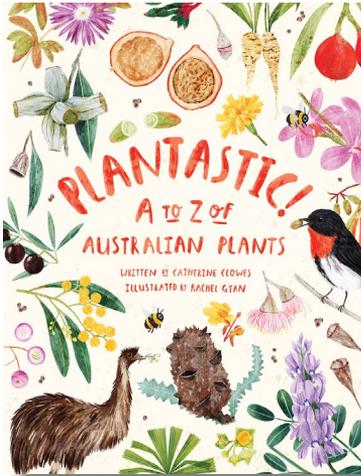
loc. - "ЧОУЧИЛА" - ТОПАЗ - 9th Mar. 2003



Half-coloured drawing of *Cissus hypoglauca* prepared for a watercolour painting of Superb Fruit-Dove that was reproduced in *Pigeons and Doves in Australia*. See Clarkson (2015). Reproduced with permission from Wendy Cooper

Plants are cool—Aussie plants for kids

Book review by Gill and Abbie Brown



Plantastic! A to Z of Australian Plants

By Catherine Clowes and Rachel Gyan

ISBN: 9781486313211 (hardback)

280 x 215 mm

CSIRO Publishing, 2021, pp. 64.

RRP AU\$29.99

This is a beautiful book for any bookshelf but is an especially lovely addition to the Australian kids' wildlife genre. My daughter Abbie and I have read a lot of kids' books over her 9 years, but this is the first that really introduces Australian plants. The examples used emphasise fun, interesting plant facts that will get the kids in such as poo, dinosaur plants and plants that eat other organisms. But because it's written by a botanist, many other plant facts are interwoven into the profiles, such as symbiosis, adaptation, plant structure, interactions, ethnobotany and photosynthesis.

The diversity covered is impressive and introduces plants that may be unknown to many non-botanist/naturalist (some may say 'normal') parents, such as *Utricularia*, *Hyban-*

thus and *Zieria*. While it doesn't cover every lineage of plant, it includes flowering plants, conifers, and ferns from 27 families. As you would expect, the large, iconic and dominant Australian families are there — Asteraceae, Leguminosae, Myrtaceae, Proteaceae and Orchidaceae—but surprisingly others such as the grasses miss out. The other families included are: Aizoaceae, Amaranthaceae, Arecaceae, Araucariaceae, Cunoniaceae, Cyatheaceae, Dicksoniaceae, Droseraceae, Haemodoraceae, Lamiaceae, Lentibulariaceae, Loranthaceae, Malvaceae, Oleaceae, Pittosporaceae, Rutaceae, Santalaceae, Scrophulariaceae, Stylidiaceae, Thymelaeaceae, Violaceae and Xanthorrhoeaceae.

There is something for parents and kids on every page and there are many ways you can read it. You can sit down and read it all in one go (probably not recommended with the kids), go through all the Plantastic Facts and Activities on each page, look at all the pictures, or, my daughter's favourite way, flick through and stop on a page and read all about that plant. CSIRO has also produced Teacher Notes and activities (<https://publish.csiro.au/book/7956>), which link the book to the Australian curriculum (Science, English and Humanities, Arts, and Social Sciences).

The book starts with a 'How to use this book' section which explains the different ways to read it and how the plants you see in your local area may look different (e.g. coloured flowers, differently shaped fruit/leaves) from those presented here. The readers are encouraged to go and look in parks, gardens as well as the bush to spot these (or similar) flowers but are reminded to stick to paths, not collect plants without a permit or permission from the landowner, and not eat wild plants.

An example of the kid-friendly language is found when the flowers of *Acacia* are described as 'fluffy balls or pipe cleaners'. But it also includes botanical terms such as 'inflorescence' and 'phyllodes'.

Being a mum, the author knows how to mix in facts with fun. The Banksia page introduces proteoid roots and Cinnamon fungus but we are also encouraged to look for a cone with woody fruits that looks like a face. Getting the kids to look at lots of different fruits = covert taxonomic training!

Confusion of common names is highlighted by three scientific names presented for the Christmas Bush in Australia depending on where you live.

Devouring insects for dinner! Well, that will get the kids' attention and it's a great way to introduce adaptation.

Ethnobotany is touched on in the Emu Bush, Fan Palm and other species pages. Introducing kids to the many uses of plants from discovering medicines, as food and for building shelters.

Fruit spread by poo... the boys will love it! But the kids who aren't obsessed by poo (I'm sure there are some) might be drawn into the Fan Palm page by the leaves or colourful fruits or the Cassowary. That's the beauty of this book, there is something for everyone.

Gum trees are familiar to most people, so this page focuses on their adaptations, animal interactions and cool facts: did you know that the Centurion gum tree measured at 100.5 m tall is almost as high as the Sydney Harbour Bridge!

How does the pollen get to the pistil? The showy Hibiscus, one of my daughter's favourite flowers, is used to introduce pollination and key flower parts (the three P's: petals, pollen, pistil).

I love the introduction of taxonomic hierarchy on the Indigo page. A bag of lollies is a family and you can divide them into different piles (genera) depending on what type of lolly they are (e.g. chocolate, jelly sweets, toffees).

Just breathe, well, that's not possible without plants. The Jasmine page connects plants using sunlight as food for photosynthesis to produce oxygen and energy.

Kids all know about kangaroos, and after reading this book they will also know about their plant namesake (Kangaroo paw).

Lots of questions will be flowing after reading about the scientific definition of fruit and how they develop. 'Mum, why do we call this a vegetable if it's actually a fruit?'

Many people would have heard of kissing under the mistletoe, but soon they will also know we have native Australian species, which are parasitic and are spread by birds' bums or beaks!

Not many people apparently notice our native succulent plants. So, the Noon-flower example, a big-flowered, cultivated plant, is a great one to introduce succulence.

Offering up the non-shop coloured/shaped orchids, this page focuses on orchid interactions with pollinators and symbiotic fungal relationships, and how these can make them vulnerable.

Perhaps the *Ptilotus* page is one of the most important because it introduces the job of a taxonomist: to identify and describe different species.

Quite a lot of plants are more than what you can see. Quandong parasitises plants (big and small) via underground roots from up to 10 m away.

Recognising plants in the bush takes practice and the R page goes through what kind of features you need to look out for when identifying species.

Smack, the trigger plant puts pollen on the insect's back. *Stylidium* tells of moving plants and the importance of cross pollination.

Trunks of tree ferns are made of roots and not bark! They've also been around for longer than the dinosaurs. Yay, plants win.

Unusual plants that trap swimming creatures in bladders. Can plants get any cooler?

Vitally, some plants such as the shrub violet can take heavy metals out of the soil into their cells (hyperaccumulation) and potentially clean polluted lands.

Wow... a living fossil that was thought to be extinct like a dinosaur! The Wollemi Pine tells the story of species discovery, ex-situ conservation and how conifers reproduce by cones and not flowers.

Xanthorrhoea (I couldn't find another x word). Want to keep kids moving on a bushwalk? Then use the Plantastic Activity suggestion to have a competition to see who can spot the tallest one.

Yo-yoing flowers of the yam daisy droop when in bud, stand upright when mature, droop again once pollinated and then straighten up again when seeds are mature.

Zierias are a great plant to encourage getting to know plants through touch and smell. This page also introduces plants that are threatened and protected by the law.

After the A–Z pages there is a map of Australia showing seven ecoregions, information on each region, and where each of the A–Z plants can be found. The regions include three grassland and shrubland regions (montane, temperate, and tropical and subtropical), two forest regions (temperate, and tropical and subtropical), deserts and shrublands, and sclerophyll forests and scrub.

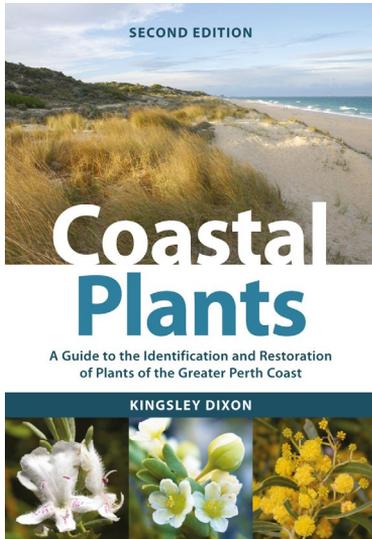
While we were reviewing this book, my daughter said 'Mum, this book should be in every school library!'. So, I'm thinking we might start that off by donating our review copy to her school to share this fun, beautifully illustrated, Plantastic book. Even though

the kids and grandkids of ASBS members have probably been introduced to Australian plants more than some others, I highly recommend adding this to their collection so they can continue to build their plant knowledge, even when you are not there.

Ed. note: Catherine Clowes, the author of this book, is a student member of ASBS. Her PhD at The University of Melbourne is focused on the phylogeny, classification and biogeography of *Spyridium* (Rhamnaceae). Cat was the recipient of a Hj. Eichler grant in the March Round of grants in 2015.

Behind the beach in Perth

Book review by Kevin Thiele



Coastal Plants: A guide to the Identification and Restoration of Plants of the Greater Perth Coast

Kingsley Dixon

ISBN: 9781486311378 (paperback) 215 x 14

CSIRO Publishing

RRP AU\$44.99

The first edition of *Coastal Plants: A guide to identification and restoration of plants of the Perth region* by Kingsley Dixon was published in 2011 and has been out of print for some time. A comprehensive, abundantly illustrated, richly detailed and practical restoration manual and field guide, it proved popular and useful for individuals, community groups and government agencies who care for Perth's fragile and at-risk coasts and their vegetation community and environments.

A second edition was published in 2020. This is a complete revision and expansion of the first; it accommodates and promotes new knowledge of restoration techniques and approaches, substantially expands and updates the plant identification section,

and introduces and provides a guide to the National Standards for the Practice of Ecological Restoration adopted by the Society for Ecological Restoration Australasia.

Coastal Plants is a nice mix of field guide and how-to guide. The field guide section includes attractively laid-out illustrated species pages for the 128 most common, dominant, ecologically important and frequently-encountered native plants and weeds of coastal dune and limestone ecosystems of the Swan Coastal Plain. The how-to guide is an extensive chapter on ecological restoration, including sections on planning, monitoring and evaluation, site preparation and planting, seed collection and sourcing, and germination and propagation. This is comprehensive, accessible, and written for practical people doing practical (and extremely valuable) work. Not surprisingly, given Kingsley Dixon's long involvement in research in this space, there are two other welcome chapters, one on ecology and biology of coastal plants, and the other on the biogeography of the Perth coast and its implications for restoration.

Even though this book is specific to one portion of Australia's vast coastline, it has application and relevance well outside the Perth region. Due to their ecology, many native species of the Swan Coastal Plain are either widespread around the temperate southern Australian coastline or have close relatives or analogues elsewhere. And of course, most of the weed species covered in the book are even more widespread. Similarly, the sections on ecology and restoration are very generalisable to other temperate and sub-tropical coastlines - coastal ecosystems are some of the most straightforwardly 'transposable' of all ecosystems.

For these reasons, this well-designed, accessible and practical guide, manual and handbook should be on the shelf and in the glovebox of everyone who works to protect, enhance, restore and enjoy Australia's fragile and important coastal plant communities.

News

An Autumn Graduation in Armidale

Jeremy Bruhl and Ian Telford



Tim Collins in UNE PhD gown with testamur and University Medal for his Bachelor of Science with Honours Class 1 and his Chancellor's Doctoral Research Medal for his PhD thesis. Photo: Jeremy Bruhl

Tim Collins, based at the University of New England, submitted his PhD thesis last December and provided three international examiners with a great holiday read. In April 2021, on the back of very positive examiners' reports, he graduated and was awarded the prestigious Chancellor's Doctoral Research Medal for his exceptional thesis 'Taxonomy, systematics, and polyploidy in *Xerochrysum*, *Coronidium* and *Helichrysum leucopsideum* (Asteraceae; Gnaphalieae)'.

Tim's thesis was broad-ranging, of great depth and thoroughness. One chapter, recently published in *Botanical Journal of the Linnean Society* (<https://doi.org/10.1093/bo-tilinean/boab020>), dealt with the origins of the popular ornamental cultivars of *X. bracteatum*, which have been grown worldwide

since the 1800s. It also included reference to naturalised plants on the island of St Helena descended from plants sent to the island for exiled Napoléon Bonaparte to remind him of Empress Joséphine's garden at Malmaison. In addition, Tim's thesis resolved the long-standing taxonomic confusion in the *X. bracteatum* species complex and in *Coronidium sens. lat.* using morphological, ultrastructural and molecular data; inferring molecular evolutionary relationships in the study group; and estimating genome sizes based on flow cytometry and chromosome counts. Altogether, Tim described one new genus and 16 new species in his study group—a fabulous achievement.

Tim was supervised by Prof. Jeremy Bruhl, Dr Rose Andrew and Dr Ian Telford (UNE), and Dr Alexander Schmidt-Lebuhn (CSIRO, Canberra). In the absence of the usual and much-loved outdoors UNE Graduation, due to COVID-restrictions, Jeremy and Ian were determined to celebrate Tim's achievement, and organised a COVID-safe event at historic 'Invergowrie' Homestead with the co-owner Dr David Moffatt.

Tim's UNE supervisors, together with Associate Professor R.D.B. (Wal) Whalley and Dr Frances Quinn, re-enacted a private graduation ceremony for Tim, complete with an academic procession. Also in attendance were Tim's partner, fellow PhD students and relatives of Dr Moffatt.

Upon the submission of his thesis, Tim was headhunted for a position at the N.S.W. Government's Biodiversity Conservation Trust. A few months later, he applied for and gained a position with N.S.W. Department of Primary Industries as Senior Scientist (Ecologist) in the Vegetation Mapping of Threatened Ecological Communities group in Queanbeyan. The new position takes advantage of his extensive skills in field botany, plant identification and plant collection, and vegetation assessment.

Tim received a Hansjörg Eichler Research

Grant in March 2015 for his study 'Rare and endangered *Eucalyptus magnificata* L.A.S.Johnson & K.D.Hill (Myrtaceae): genetic diversity and taxonomy', also undertaken at UNE – Ed.



Tim with his UNE PhD supervisors Prof. Jeremy Bruhl, Dr Rose Andrew and Dr Ian Telford in the garden at 'Invergowrie'. Ian's Arya in the foreground. Photo: David Moffatt

Serventy Conservation Award

Congratulations to Kevin Kenneally for receiving the 2020 Serventy Conservation Award from the Australian Wildlife Society.

The annual award commemorates the commitment to the conservation and preservation of Australian wildlife by Dominic Serventy, his brother Vincent Serventy, and his sister Lucy. It is intended to recognise and celebrate conservation work that has not been done as part of a professional career and is awarded to those who labour for a love of nature and its conservation.

As a boy growing up in Perth, Kevin developed a love of nature and in 1964 joined The University of Western Australia's Botany Department, where he worked under Professor Brian Grieve, who fostered his interest in Western Australia's botany. In 1967–68 he was conscripted into the Australian Army and served in Vietnam.

In 1973, Kevin joined the Western Australian Herbarium as a research botanist. In 1974 and 1975 he participated in biological surveys of the Prince Regent River Nature Reserve and

the Drysdale River National Park in the Kimberley, during which he fell in love with the area. The region became the main focus of his career over the next 40 years. He took part in every major biological survey of the Kimberley, and it was in that region that he developed a deep appreciation for Western Australia's Indigenous cultures.

Throughout his career Kevin worked towards taking science to people and involving them in its study. He was the inaugural scientific director of the multidisciplinary Landscape Expeditions that provided volunteers with the opportunity to be involved in hands-on wildlife research led by Australian and overseas scientists. Over seventeen years, the citizen science program involved over 1,000 volunteers and raised two million dollars for wildlife research.

He has been active in a number of organisations: the Western Australian Naturalists' Club, the Kimberley Society, and the Western Australian Gould League and its headquarters at the Herdsman Lake Wildlife Centre.

He has published widely through books and papers, especially on the Kimberley but also on a particular systematic interest, the Styliaceae.

https://www.aws.org.au/wp-content/uploads/2021/04/AWS_2020_Serventy_Conservation_Award.pdf



Suzanne Medway (immediate past President of the Australian Wildlife Society), Kevin Kenneally and Kevin's wife Irene Ioannakis, with his Serventy Conservation Award. Photo: Megan Fabian.

The history and status of *Eucalyptus persicifolia* G.Lodd. (Myrtaceae)

A.R. Bean

Queensland Herbarium

The Botanical Cabinet was a journal produced by the commercial nursery of Conrad Loddiges and Sons in the early 1800s. It comprises watercolour paintings of individual plant species together with an accompanying text, which sometimes included a brief morphological description. The identity of many of the paintings is uncertain because there were no voucher specimens preserved. Turner (2016) wrote 'There is no evidence that George Loddiges or anyone else directly associated with the nursery made or kept herbarium specimens. The plants were drawn from life and were presumably returned to the nursery after being drawn or the cut shoot discarded.'

Turner (2016) advocated using the authorship 'G.Lodd.' for all species described in *The Botanical Cabinet*. This is because George Lodd was the more scientific of the brothers, and because the father was already 78 years old when the publication of *Botanical Cabinet* began.

Eucalyptus persicifolia G.Lodd., *Botanical Cabinet* 6: t. 501 (1821). Lectotype: [illustration] '*Eucalyptus persicifolia*' in Loddiges, *Bot. Cab.* 6: t. 501 (1821), fide Turner (2016).

Candolle (1828) included *E. persicifolia* in his *Prodromus*. He routinely included the notation 'v.s.' [seen dried] after the description, for species where he had seen herbarium specimens, but this notation is missing for *E. persicifolia*. The lack of a specimen did not prevent him from assigning some Sieber specimens as (unnamed) varieties of *E. persicifolia*, presumably based on their resemblance to the illustration.

Maiden (1903: 31) wrote:

'But De Candolle (who doubtless saw Lod-

diges' specimens) referred them to Sieber's Nos. 593 and 477...'

Maiden apparently identified these Sieber specimens as *E. pilularis* Sm. Because he thought that Candolle had seen authentic herbarium specimens of *E. persicifolia*, Maiden was prepared to accept that *E. persicifolia* = *E. pilularis*.

Bentham (1867: 240), under his treatment of *E. viminalis* Labill., included:

'*E. persicifolia* Lodd., *Bot. Cab.* t. 501 (from the fig.[figure])'.

Maiden (1916: 136) wrote:

'I have not seen Loddiges' plant, which Bentham refers to *E. viminalis* (of which, if correctly referred to that species, it must be a multiflowered form). The leaves are narrow-lanceolate. The *Index Kewensis* states that *E. persicifolia* Lodd. is synonymous with *E. Stuartiana*. By that *E. ovata* is meant. It may be, but it is doubtful.'

Despite these reservations, Maiden went ahead and there included *E. persicifolia* as a synonym of *E. ovata* Labill. He did not mention his previous placement of *E. persicifolia* as a synonym of *E. pilularis*. Later in the same publication, he (Maiden 1916: 171) included *E. persicifolia* as one of five 'reputed synonyms' of *E. viminalis*. The reputed synonyms appear to be synonymies made by Bentham that Maiden did not necessarily agree with.

No one since Maiden has questioned the identity of *E. persicifolia*. The synonymy given by later authors seemingly depends on which of Maiden's passages was read by them. Blakely (1934), Johnston & Marryatt (1965), Chippendale (1988), EUCLID (2015) and Turner (2016) have all placed *E. persicifo-*

lia as a synonym of *E. pilularis*; Hill (2002–04) placed it in synonymy with *E. ovata*; while Ross (1986) included it under *E. viminalis*.

The protologue includes an illustration of reasonable quality. It shows a branchlet bearing leaves, buds and flowers. Inflorescences are axillary; the buds have a conical operculum; the pedicels are perhaps 2–4 mm long. The leaves are lanceolate, with lateral veins shown at about 45 degrees, widely spaced. The brief description is non-diagnostic, except in stating that there are ‘six to twelve blossoms’ per inflorescence.

Using the interactive key *Euclid: Eucalypts of Australia Version 4* (EUCLID 2015), the following seven character states were entered: 1. leaves alternate; 2. leaves lanceolate 3. lateral leaf veins at about 45°; 4. inflorescences axillary, single; 5. pedicels 2–4 mm long; 6. operculum conical; 7. buds more than 7, to 15 per umbel. These are the only morphological characters available from the illustration. 239 *Eucalyptus* species matched these character states.

When the distribution character is added (using N.S.W. and Tas. and southern W.A., these being the only likely areas where seeds would have been collected pre-1817), the number of potential identities was reduced to 209 species.

The inevitable conclusion is that *E. persicifolia* could never be identified to species level from the illustration or accompanying (brief) description. It must be regarded as a nomen dubium.

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‘Chinese’ Wilson, Kewites and Australia

Philip Short, Darwin

Several years ago, I became aware that *The Journal of the Kew Guild*, established in 1893 and still in publication, is on-line.¹ I have no recollection of ever seeing this publication in an Australian herbarium library and was therefore delighted to find that it can be sourced electronically. It is a wonderful resource for anyone attempting to find information concerning Kew Gardens and the activities of its staff and students (Kewites), and sometimes associated staff such as Australian Botanical Liaison Officers (ABLO).²

I came across the electronic version when searching for information about C.E.F. Allen (1876–1938), among other things a significant collector of plants in south-east Africa and northern Australia in the early part of last century. He was referred to in an article (Wilson 1923), written by Ernest Henry Wilson, often referred to as ‘Chinese’ Wilson (1876–1930) due to his fame for collecting and introducing numerous Chinese and other Asian plants to the West.³ It is a brief history of the influence of Kew on Australian botany,⁴ and highlights the necessity of having had ABLOs at K in previous years; that we no longer do so is a great shame. The article is reproduced below, with permission, and is essentially in its original form, thus the reason, for example, that *E. obliqua* is the only binomial which is italicised, personal epithets are capitalised, and the ending -aceae is used for family names.

1. <https://kewguild.org.uk/journal/online-journal/>

2. Alex George, the current Associate Editor of this Newsletter, was President of the Guild in 2010–11.

3. For more information on Wilson see: https://en.wikipedia.org/wiki/Ernest_Henry_Wilson and references there-in. When he

wrote this article, Wilson was President of the Guild, and p. 140 of the same volume 4 (30) from which this article has been extracted, has a biography.

4. Wilson, E.H. (1923). Kewites and Australia. *The Journal of the Kew Guild* 4 (30): 167–170.

<https://issuu.com/kewguildjournal/docs/v4s30p139-all> [Accessed 19 May 2021].

KEWITES AND AUSTRALIA

THE association of Kewites with Australia dates from very early times in the history of the austral continent. Indeed, the “Father of Australia” himself, the great Sir Joseph Banks, was a Kewite, since after his return in 1771 from the famous voyage round the world with Captain Cook, which among other accomplishments resulted in the discovery, naming, and annexation of New South Wales, he was appointed Honorary Director of Kew in 1772. The period of the keen directorship of this noble Englishman—traveller and scientist, patron of horticulture and botany—saw collectors sent far and wide, and the introduction of new plants to Kew was phenomenal, as the record in the two editions of Aiton’s *Hortus Kewensis* testify.

Through the influence of Sir Joseph Banks, David Nelson, a Kew gardener, was appointed collector on Captain Cook’s third voyage (1776–80). Captain Cook on this voyage put into Adventure Bay, Tasmania, in January, 1777. There Nelson gathered specimens of a tree which were taken to Europe and on them L’Héritier founded the genus *Eucalyptus* and named the species *E. obliqua*, L’Hérit. In April, 1921, it was my good fortune to be in Tasmania and it seemed fitting to visit Adventure Bay and collect material of this *Eucalypt* in the type locality. After his safe return from this voyage Nelson was appointed botanical collector to the voyage of H.M.S. ‘Bounty’ commanded by Captain Bligh. One of the principal objects of this voyage was to transport Breadfruit trees from Tahiti to the West Indies. The story of the “Mutiny of

the *Bounty*” need not be given here. David Nelson was one of those sent adrift in an open boat by the mutineers. This boat was successfully navigated for 3000 miles to the island of Timor, where David Nelson died of fever, contracted through the hardships and exposure of the voyage, on June 20, 1789. Captain Bligh says of Nelson, “whose good conduct in the course of the whole voyage and manly fortitude in our late disastrous circumstances deserves this tribute to his memory.”

In March, 1801, Peter Good, a foreman in Kew, was appointed botanical collector under Robert Brown, the botanist attached to Flinder’s [sic] voyage, in H.M.S. ‘Investigator.’ He died of dysentery [sic], June 11, 1803, on board the ‘Investigator,’ and was buried at Sydney. Robert Brown writing to Banks says, “Poor Peter Good, who while he enjoyed health was most indefatigable, and whose exertions in his department were without doubt the cause of his untimely fate, died of dysentery contracted soon after our departure from Timor.” From Good’s seeds many new plants were raised, conspicuous among them being numerous species of Proteaceæ, Myrtaceæ, and shrubby Leguminosæ which ultimately made Kew famous for New Holland plants. Dr. Lindley called special attention to these plants in his “Report on Kew” drawn up in 1838.

The next Kewite to visit Australia was Allan Cunningham who, in the capacity of King’s Botanist, landed at Sydney on December 21, 1816. Allan had previously won his spurs in Brazil, where he collected for two years in the vicinity of Rio, the Organ Mountains, San Paulo, and elsewhere. Sir Joseph Banks wrote that his collections, especially of orchids, bromeliads, and bulbs “did credit to the expedition and honor to the Royal Gardens.” From his arrival until February 25, 1831, Cunningham explored and collected assiduously, adding a vast number of new plants to gardens. He twice circumnavigated Australia, visiting Norfolk Island, Tasmania, and New Zealand, He also made many long

and difficult overland journeys of exploration which lead [sic] to the opening up of enormous tracts of valuable agricultural land. In 1831 he returned to England and resided at Kew until 1836 when he accepted the post of Colonial Botanist, Sidney [sic], where he arrived on February 12, 1837. A few months later, dissatisfied with the large amount of vegetable-growing he was required to do for the officers of the Colony, which took him away from his legitimate botanical duties, he sent in his resignation. Free of official life Allan again devoted himself to collecting. He visited New Zealand, but returned in a deplorable state of health in October, 1838. Hardships and privations had, indeed, done their work and on June 27, 1839, died Allan Cunningham, one of the greatest plant collectors of all times and one of the brightest stars in the crown that adorns the brow of our Imperial Mother. Ye Present Kewites think of this worthy exemplar when next on your botanising hour you note the lofty *Araucaria Cunninghamii* in the Temperate House or *Platycerium grande* in the Tropical Fernery, or pot up plants of *Grevillea robusta* for the greenhouse. ‘Twas Allan Cunningham who discovered these. His remains have found a fitting resting place beneath an obelisk in the Sydney Botanic Gardens among the plants he loved too well.

Soon after Allan Cunningham returned to England [in 1831] the post of Colonial Botanist and charge of the Botanic Gardens at Sydney became vacant. It was offered to him, but he declined it in favour of his brother, Richard, who was appointed to the post in 1832. Richard Cunningham landed at Sydney in January, 1833. He was murdered by the aborigines while on a collecting tour in the interior in April, 1835.

The eminent ornithologist, John Gould, began his career as a gardener at Ripley Castle and later entered Kew, where he received twelve shillings a week with two shillings extra for Sunday duty. In 1827 he became taxidermist to the London Zoological Society. In 1838 he visited Australia,

spending two years there collecting material for his monumental, seven-volume work on the birds of Australia. In the field of ornithology, Gould attained not only fame but wealth—a most unusual achievement for any Kewite. He died in London in 1881.

In 1840 and again in 1841, the great Sir Joseph Hooker visited Tasmania and collected many plants. Later he published his *Flora of Tasmania* and his *Essay on the flora of Australia*.

In 1847, Charles Moore, a Kewite, was appointed to take charge of the Sydney Botanic Gardens and filled the post until 1896. During his directorship the gardens were considerably developed and many new plants found their way into cultivation. In 1869, Moore, introduced the now indispensable *Kentia Belmoreana* and *K. Forsteriana* from Lord Howe Island. Another Kewite, John Boorman, has been associated with the Sydney Botanic Gardens since 1885 as plant collector.

In the development of the Botanic Garden at Brisbane, Kew men have played the leading part. Walter Hill, who left Kew in 1851, founded it about 1855 and nursed it along until his retirement in 1881. Later Robert Whittle did his bit and so also did Philip McMahon—both Kewites, who, with Hill, have joined the great majority.

To-day, C. E. F. Allen at Port Darwin, in northern Australia, is industriously trying to found a botanic garden in a land where sympathy and interest of all kind save in politics are sadly wanting. Two other Kewites I met doing their bit in Australia. One, William Leslie, whose work in Trinidad and on the West coast of Africa seriously undermined his health, is helping to develop the fruit industry for the government of Queensland. The other, W. H. Paine has deserted horticulture, but is doing valuable work as manager of the Animal Foods department of New South Wales.

Now a word in regard to Australia as a

field for Kew men. It is summed up in Punch's famous advice to those about to marry—Don't. Australia is a vast, but empty continent. Potentially it is one of the richest lands on earth. The possibilities for tropical agriculture in Queensland alone are enormous. But the fair tropics of Australia will never be properly developed until suitable coloured labour is employed. It is monstrous to ask a white woman to live, rear a family, and do her own house-work in the tropics, and this is precisely what the policy "White Australia" demands of a woman. Much is made of education in these days, but why should the white man want to be both the brains and muscle of the world? In the southern continent the opportunities for Kewites are almost non-existent. Politics of the labour-union kind, often strongly tainted with Bolshevism, are the curse of the country. The sentiment is Australian billets for Australians and so long as there are Australians fit to fill them the cry is legitimate. There is plenty of room in Australia for agricultural labourers and for men with a "few thousands" to take up ranching and farming. For gardeners demand is extremely limited and very few of the billets are worthy of a Kew man; always excepting of course the Botanic Gardens on which no praise can be too highly bestowed. Between the pioneering stage and that of ease and culture which follows acquisition of wealth there is, in the history of every land, a long developmental period. Kew men as pioneers have been ever sought after. They have blazed the trails and salted them with their bones. But others reap where Kewites sow. History repeats itself in every land so why expect Australia to be the exception?—E. H. WILSON.

WARNING

Some material in the article above, which is reproduced verbatim from *Kew Guild Journal* (1923), is culturally offensive, including racist and sexist remarks that could be upsetting for some readers. These views, reflecting the attitudes of the original author (E.H. Wilson), are not those of ASBS Council or the *Newsletter* editors.

Online and in the media

Todd McLay

Two new species found in path of highway plans

Pre-roadwork surveys in New South Wales have led to the discovery of two new species of plants (*Fontainea* and *Pittosporum*). Featuring the work of both Queensland and New South Wales state herbaria, this work is a clear example of the value of survey work, and how much we still have to learn about even heavily populated and well-traveled parts of Australia.

<https://www.abc.net.au/news/2021-05-21/rare-plant-species-found-near-highway-coffs-harbour-nsw/100149038>

Tree rings tell a story of historical megadroughts

Using tree rings of very old *Callitris columellaris*, UWA scientists were able to track rainfall patterns over the last 700 years in the Western Australian wheatbelt region. They found that the region has historically been much drier than expected; according to the trees, the 20th century was the wettest they have experienced.

<https://theconversation.com/we-found-a-secret-history-of-megadroughts-written-in-tree-rings-the-wheatbelts-future-may-be-drier-than-we-thought-160526>



Callitris trees by a salt lake. Photo: Alison O'Donnell

Infinite Herbarium - create new species of plants

Incredible creativity, modern computer technology, and historical botanical art has combined to allow for the creation of new plant species. Best summed up by this statement: 'Using similar technology to that which powers Google Lens, participants are invited to create a plant "morph". Two plants are identified. The visual characteristics of those plants are fed into a ML model that has been trained to generate mutating plant images through exposure to scientific illustration data, made available in the open source Biodiversity Heritage Library'.

Head to the website, take photos of a couple of plants, and see what sort of new species you can create!

<https://infiniteherbarium.withgoogle.com/>

An interview with Peter Raven

Robyn Williams, on the ABC's *Science Show*, recently interviewed Peter Raven (American botanist and environmentalist, former Director of Missouri Botanical Garden, generally great man) about his recent new book, *Driven by Nature*. As well as the book, they discuss how Raven became interested in plants, thoughts on the future of botanic gardens, and overpopulation.

<https://www.abc.net.au/radionational/programs/scienceshow/peter-raven---driven-by-nature/13334242>

The book review editor may have a copy of this book available for review. Get in touch with him if you are interested. (Ed.)

Investigating the publishing strategy of MDPI journals

MDPI (Multidisciplinary Digital Publishing Institute) is an open-access only scientific publishing company. Its journals relevant to the plant systematists include *Genes*, *Plants*, *Conservation*, *Diversity*, *Journal of Fungi*,

Taxonomy, and many more. In the article below, the author investigates some features of MDPI journals, including rapid publication rates (including 15-day turnarounds for decisions), and a high number of Special Issues (and offers of Special Issue editing), and speculates on the reasons behind these publication strategies (Ed. Note: I do not agree with all of these speculations, and believe that a good paper in MDPI is still a good paper). It is also worth reading the comments for alternative points of view.

<https://paolocrosetto.wordpress.com/2021/04/12/is-mdpi-a-predatory-publisher/>

Mysterious spinifex grass rings of the Australian outback may be caused by microbes

The classic ring formation of old spinifex hummocks (*Triodia* sp.) may be linked to microbial inhibition of growth, rather than age or aridity. Based on a small sample for now, but a potentially interesting area to investigate.

<https://www.abc.net.au/news/science/2021-05-16/spinifex-hole-mystery-australian-outback-microbes/100083850>



Triodia basedowii

The 50 beautiful Australian plants at greatest risk of extinction — and how to save them

In 2018, the Threatened Species Hub produced the Plants Red Hot List: Australia's

100 most endangered plants. Now, they have produced an action plan for each of the 50 species identified as having the highest imminent risk of extinction. This represents a nationwide concerted strategy to identify the most threatened species, and plan for their protection. A detailed multi-page report is available for each species, which includes a brief description, a conservation overview, threats, and conservation objectives. Interestingly, three of the 50 most imperilled species are not formally named.

<https://theconversation.com/the-50-beautiful-australian-plants-at-greatest-risk-of-extinction-and-how-to-save-them-160362>

<https://www.nespthreatenedspecies.edu.au/publications-and-tools/action-plan-for-australia-s-imperilled-plants-2021>

Arid botanic gardens in Mildura

The focus of the botanic gardens in most of Australia's major cities is (climatically necessarily) is on more mesic flora. Not so for the Australian inland botanic garden, in Mildura, Victoria.

<https://www.abc.net.au/news/2021-05-17/australian-inland-botanic-gardens-international-flora-oasis/100112694>

Papers and publications

A meta-analysis of fern population genomics

Despite being a large component of the global flora, ferns are relatively understudied when it comes to population genetics. The authors compiled data from 87 publications on fern population genetics, and found that both mating system and growth habit have significant impacts on genetic diversity and population structuring. Interestingly, of the 508 taxa in Oceania, only two species had population genetic data for this meta-analysis. Clearly a field to explore.

From Genomes to Populations: A Meta-analysis and Review of Fern Population Genetics, Pelosi & Sessa 2021, *International Journal of Plant Sciences*.

<https://www.journals.uchicago.edu/doi/abs/10.1086/713442>

Eremophila and friends

Eremophila (emu bushes) is one of the largest genera in Australia, with over 230 formally described species. It is placed in the tribe Myoporeae, with widespread genera such as *Myoporum*, and narrow endemics such as *Calamphoreus* and *Diocirea*. In this paper, phylogenomic analyses indicate that *Eremophila* is paraphyletic, and several evolutionary clades are identified within the tribe.

Molecular phylogeny of tribe Myoporeae (Scrophulariaceae) using nuclear ribosomal DNA: Generic relationships and evidence for major clades, Fowler *et al.* 2021, *Taxon*.

<https://onlinelibrary.wiley.com/doi/full/10.1002/tax.12495>

(Ed. Note: I am a co-author on this paper but it is excellent work in spite of this)



Eremophila nivea

Phenological responses to climate change based on a hundred years of herbarium collections of tropical Melastomataceae

To investigate whether climate change has impacted flowering time in tropical plants, these researchers assessed 1,400 herbarium images across four species for the presence of reproductive material, from specimens collected between 1920 and 2018. The dataset was compared against climatic databases, and a significant alteration of flowering time was found in association with temperature and rainfall fluctuations.

Phenological responses to climate change based on a hundred years of herbarium collections of tropical Melastomataceae, Lima *et al.*, 2021, PLoS One.

<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0251360>

The impact of the Black Summer fires on the flora

Several articles detailing the impact of the 2019–2020 fires in eastern Australia on the vegetation were published in the last few months.

Implications of the 2019–2020 megafires for the biogeography and conservation of Australian vegetation, Godfree *et al.*, 2021, Nature Communications.

<https://www.nature.com/articles/s41467-021-21266-5>

High fire frequency and the impact of the 2019–2020 megafires on Australian plant diversity, Gallagher *et al.*, 2021, *Diversity and Distributions*.

<https://onlinelibrary.wiley.com/doi/full/10.1111/ddi.13265>

Connections of climate change and variability to large and extreme forest fires in southeast Australia, Abram *et al.*, 2021, *Communications Earth & Environment*.

<https://www.nature.com/articles/s43247-020-00065-8>

In the beginning...

The origin of ASBS may be traced to the letter below, from Jim Willis in Melbourne, sent to many colleagues around Australia for discussion and comment. This led to our inaugural meeting in Melbourne, the minutes of which are published here for the first time.

SUGGESTED FORMATION OF A SOCIETY,
ASSOCIATION (OR OTHER REPRESENTATIVE BODY)
OF AUSTRALIAN PLANT TAXONOMISTS

At a second meeting of nine Victorian plant taxonomists (from the National Herbarium and three metropolitan universities), held in Melbourne on 29 April 1971, further consideration was given to Item 6 on the circulated statement of March 2nd. It was reiterated that the interests of plant taxonomy, on a national basis, would be better served by an organization more representative, more flexible, more cohesive and with more continuity than the existing Systematic Botany Committee of A.N.Z.A.A.S, the personnel of which fluctuates with each successive congress of that Association.

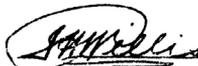
The meeting agreed upon the desirability of forming some kind of society (or other body) which could make overtures to the Australian Academy of Science, Government Departments etc. regarding measures to be taken and funds to be allocated for the production of new publications on the Australian flora.

The meeting further agreed, as a first step, to circularize all Australian plant taxonomists known to it, asking each one to indicate whether he/she would support the formation of such a body or whether there is a preference for taxonomists to continue, as they do now, along lines of more individual action.

As a point for discussion, some of the objectives of a society of Australian plant taxonomists could include the following:

1. To provide a forum for taxonomists throughout Australia.
2. To promote and support work on the flora of Australia (whether by monographs, indices, handbooks etc.), and be prepared to give advice on administration of funds.
3. To assist and initiate other projects (such as data retrieval) which may be of use to Australian taxonomists.
4. To encourage the teaching of taxonomy at tertiary level, and investigate the funding of such.
5. To arrange meetings of taxonomists during A.N.Z.A.A.S. congresses, and at other times as necessary.

An expression of your personal opinion would be much appreciated.



J.H. WILLIS
(Convener),
Melbourne, 29 April, 1971.

Inaugural meeting

The minutes of the meeting that decided to form the society were not published in the Newsletter and are reproduced here. They include apologies but, apart from those mentioned, there appears to be no record of attendees. We hope that this will be found during a search of the Society's archives at MEL, in the lead-up to our 50th anniversary.

Australian Systematic Botany Society: Minutes of the Inaugural Meeting

Minutes of the meeting held at the National Herbarium, Melbourne, on Saturday, 7 April 1973 at 2.00pm.

Dr Churchill welcomed those attending the meeting. There were 47 people, representing all states except the Northern Territory.

Apologies were received from: Dr N.T. Burbidge (Canberra), Dr H.T. Clifford and Mr S.L. Everist (Brisbane), Dr D. Frodin (Port Moresby, TPNG), Dr L.A.S. Johnson (Sydney), Mr T.R.N. Lothian (Adelaide), Mr J. Maconochie (Alice Springs), and Mr D. Morris (Hobart).

Professor Chambers took the chair and moved a vote of thanks to Dr Churchill and Miss Aston for attending to the organisation of the inaugural meeting.

The chairman proposed that the broad details of the constitution should be settled here, and certain points agreed on as a guide for subsequent meetings. The minutiae would have to be settled later.

Three documents were provided as a basis for discussion – a composite draft rules drawn up at Melbourne incorporating comments from meetings of various herbaria on the original draft constitution; a report from the meeting in Canberra too late to be included in the composite draft; and the draft of a constitution drawn up by Prof. Carr.

During the discussion the following motions were carried, and points raised:

1. The name of the society shall be: "Australian Systematic Botany Society".
2. The object of the society is to foster the study of systematics.
3. Membership of the society shall be open to all those interested in systematics.
4. The affairs of the society shall be managed by a Council of six members, including a President, a Vice-president, a Secretary, and a Treasurer.
5. The term of office for members of the Council shall be from one general meeting to the next.
6. The incoming Council be empowered to formulate a method for giving some continuity to the Council.
7. The documents before the meeting should go to the Council and they should draw up the best possible Constitution and supporting Rules, and present these before the next general meeting for adoption at that meeting.

8. At this meeting, the Council shall be elected from persons interested in systematics, and willing to accept nomination.

The following Council was elected:

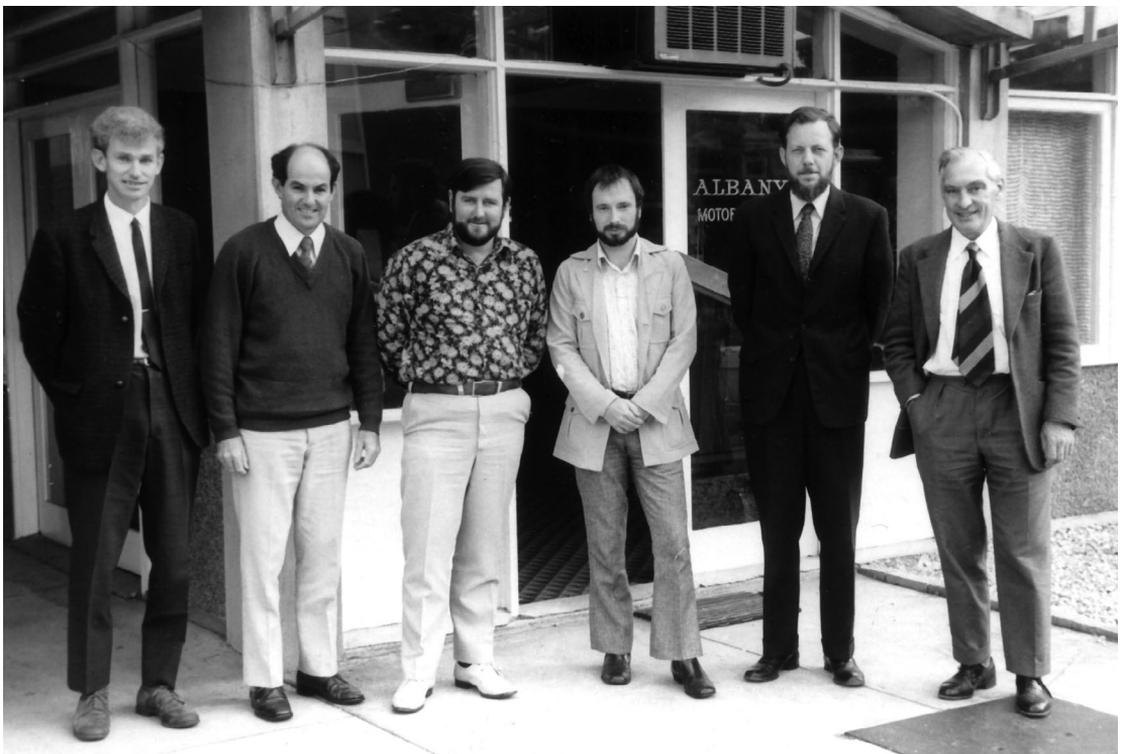
President:	Dr T. Whiffin
Vice-president:	Prof. D.J. Carr
Secretary:	Mr D.J. McGillivray
Treasurer:	Dr A. Kanis
Council members:	Mr D. Boyland Mr A.S. George

9. The next meeting of this society, at which the Constitution will be put before members, shall be in Perth at the time of the ANZAAS Congress.

In addition, there was a report on the Australian Academy of Science given by Mr J.H. Willis, Dr Hj. Eichler, and Prof. D.J. Carr. There was also a discussion of Professional Standards, and of Publication.

In conclusion, there was a vote of thanks passed to all those who had made the meeting possible. The meeting finished at 6.40pm.

The following day, while most attendees headed off for a relaxing excursion, the Council got down to business with a meeting at the Albany Motor Hotel in Millswyn Street, South Yarra.



Inaugural Council, 8 April 1973; left to right: Alex George (PERTH), Don McGillivray (NSW), Des Boyland (BRI), Trevor Whiffin (La Trobe), Andrew Kanis (CANB), Denis Carr (ANU).

Our logos

The logo used on the cover of the Newsletter from numbers 1 to 5 was shown in Newsletter 186, p. 40. At the time, the story behind it appeared lost, but Alex George has now found a letter dated 14 Nov. 1973 from the inaugural editor, Des Boyland, in which he explained that 'The insignia has no meaning – It is a tree – a chromosome plate – a palm – fructification of *Aspergillus* – The dawning of a new era etc. ...'

At a meeting on 12 May 1975, Council agreed that 'the Society should have a distinctive letterhead' and the Secretary, Karen Wilson, undertook to arrange some designs for consideration. Four hand-drawn designs by Christine Payne at NSW were circulated to council members and discussed among members in local chapters. One featured a map of Australia with an umbel of three bloodwood fruits and the slogan 'A fructibus nostris' (By our fruits). Two were circular designs, one with a *Xanthorrhoea*, one with a gum leaf and single bloodwood fruit. The fourth was a rectangle also with a gum leaf and single bloodwood fruit. Each included the letters ASBS. The vote was clearly for the *Xanthorrhoea*, though the Brisbane Chapter felt that they should have been invited to contribute designs.



Design 1



Design 2



Design 3



Design 4

<u>RESULTS OF LOGO QUESTIONNAIRE</u>					
<u>PERSON</u>	<u>DESIGN</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>
Whiffin		4	2	3	1
Henderson		4	3	1	2
Wilson		4	2	1	3
Lazarides		1	4	2	3
Armstrong		4	3	1	2
George		2	4	1	3
		19	18	9	14

COMMENTS

Whiffin: If 4, then outer circle should be complete, thus enclosing the letters A.S.B.S.

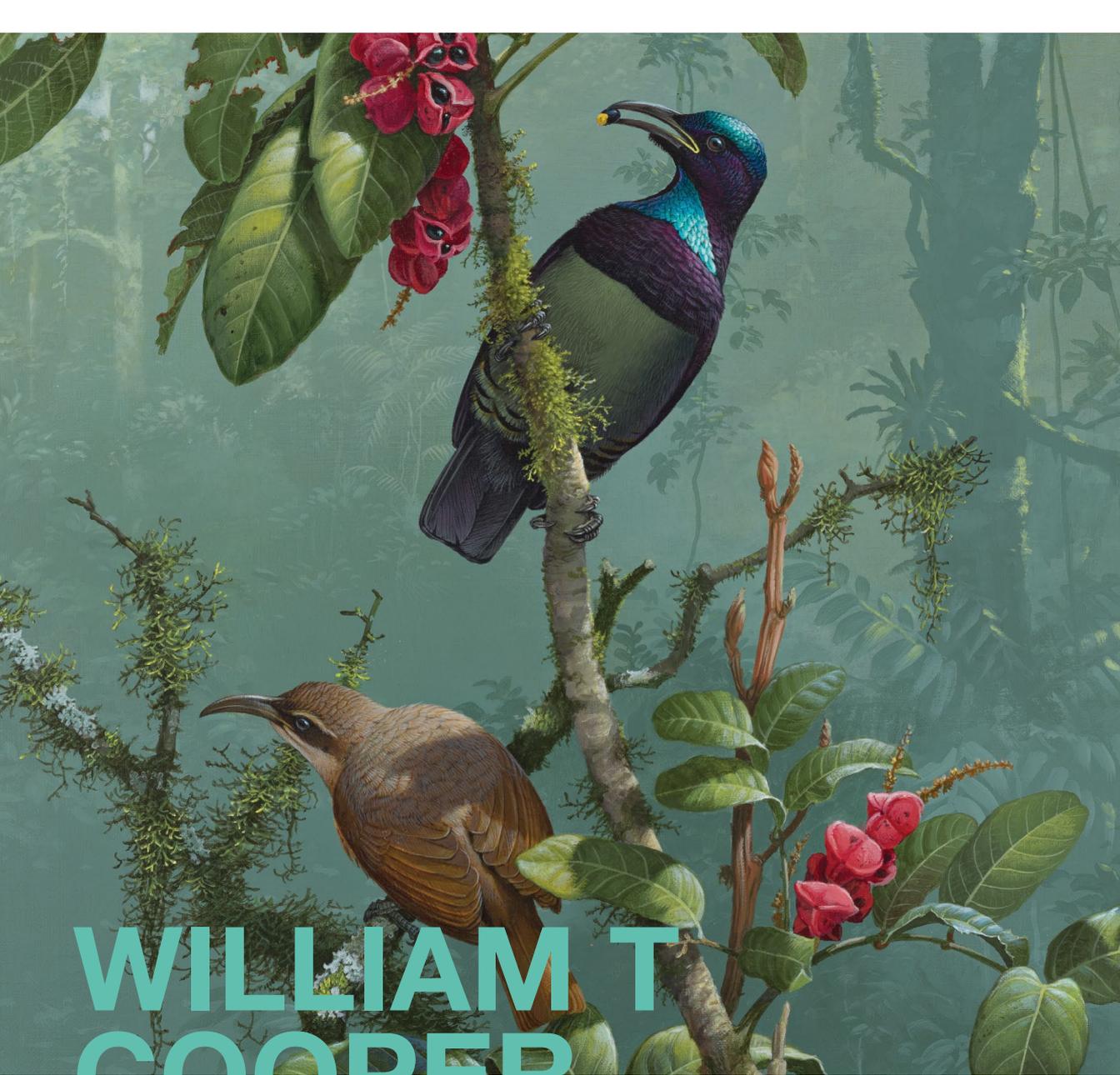
Lazarides: Delete Latin script from 1 if chosen.

George: If 3, then re-draw leaves to look more like a Xanthorrhoea.
(Will be done!)

Henderson: Not really satisfied with any of them; would prefer something with more general appeal (i.e. to mycologists, algologists, ecologists, etc.). The Brisbane chapter feel they should have been asked to contribute designs. Suggest holding a general vote through the Newsletter or even asking for new designs.

Golden anniversary celebrations

The Australian (now Australasian) Systematic Botany Society was formed at a meeting in Melbourne in early 1973 and the first General Meeting held in August that year in Perth, Western Australia. This means that the Society is just 2 years away from celebrating its 50th anniversary. Hopefully, the coronavirus pandemic will have been consigned to history by then and we can meet face-to-face. In the meantime, we are running a regular feature in the Newsletter which will delve into the past 50 years and look forward to its next half century. John Clarkson, who is chairing a small working group (currently Alex George, Kevin Thiele and Karen Wilson), would welcome hearing from members, young and old, who might have ideas and might be willing to help us plan for this significant milestone.



WILLIAM T COOPER

BOTANICAL ART OF THE TROPICAL RAINFOREST

28 AUG –
4 DEC 2021

William T COOPER
Victoria's Riflebirds at Topaz (detail) 1993
acrylic on canvas on board
75 x 50cm
Collection of Robyn Lewis

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🌐 www.cairnsartgallery.com.au

The Newsletter

The ASBS newsletter keeps members informed of society events and news, and provides a platform for debate and discussion. The newsletter is published quarterly on the ASBS website and in print. Original articles, notes and letters (not exceeding ten published pages in length) are encouraged for submission by ASBS members.

Have an article or an idea for the newsletter?

Send it to Lizzy (Editor):
lizzy.joyce@my.jcu.edu.au,
or Alex (Associate Editor):
a.george@murdoch.edu.au

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Advertising Advertising space is available for products or services of interest to ASBS members at the following rates (AUD):

Full page: \$200

Half page: \$100

Flyers: \$250

A 20% discount applies for regular advertisements. ASBS members are exempt from advertisement fees but not insertion costs for flyers (\$50). For advertising enquiries please contact the editor.

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<https://www.cavedesign.com.au>

The Society

The Australasian Systematic Botany Society is an incorporated association of over 300 people with professional or amateur interest in botany. The aim of the society is to promote the study of plant systematics.

Membership is open to all interested in plant systematics. Members are entitled to attend general and chapter meetings, and to receive the *ASBS Newsletter*. Any person may apply for membership by filling in a membership application form available at <http://www.asbs.org.au/asbs/membership.html>, and forwarding it to the Treasurer. Subscriptions become due on 1 January each year.

The ASBS annual membership subscription is AUD \$45, and a concessional rate of AUD \$25 is offered to full-time students, retirees and unemployed people. Payment may be by credit card or by cheque made out to Australasian Systematic Botany Society Inc., and remitted to the Treasurer. All changes of address should be sent directly to the Treasurer as well.

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Front cover: *Veronica baylyi* Garn.-Jones by Jodie Vernie (née McLay). This was commissioned as a gift to President Mike Bayly by former student, now ASBS News Editor, Todd McLay. Mike Bayly worked on New Zealand *Veronica* with Phil Garnock-Jones between 1996 and 2005.