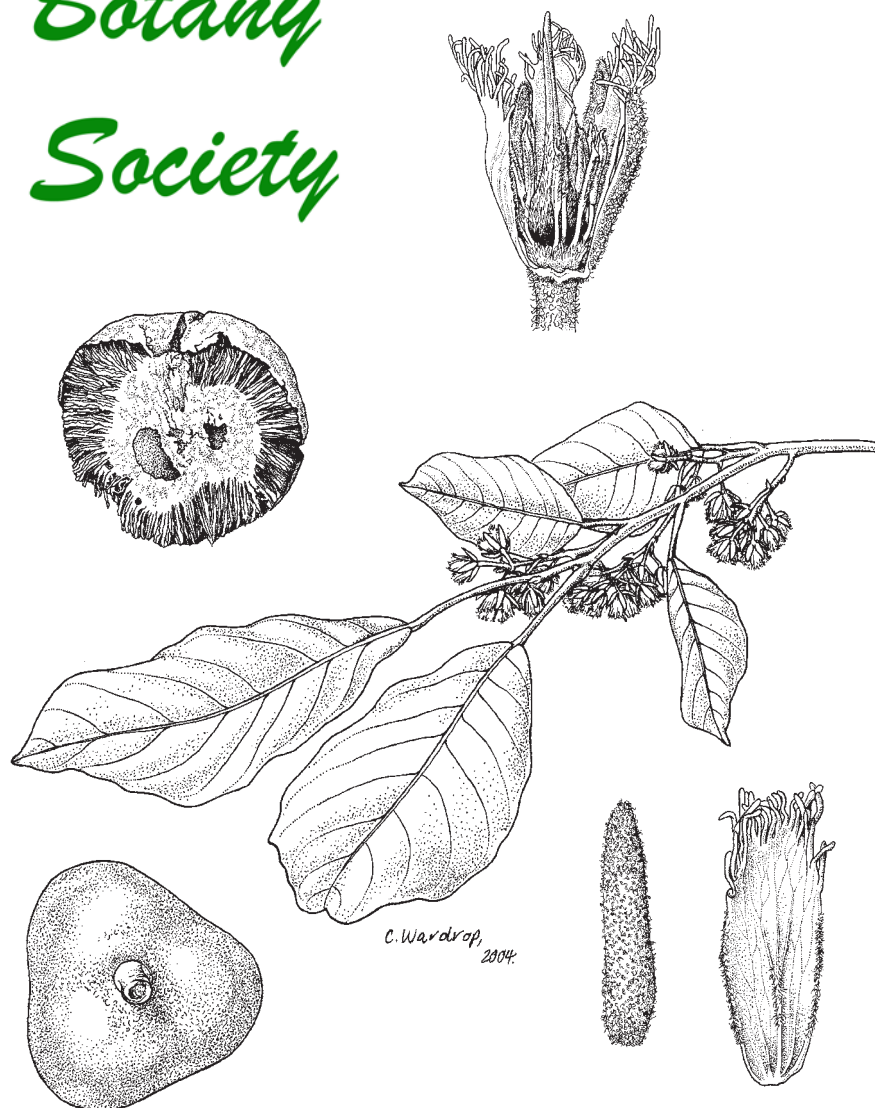


ASBS

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Grant application closing dates

Hansjörg Eichler Research Fund:
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Marlies Eichler Postdoctoral Fellowship:
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Papua New Guinea Botanical Society

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Web presence

ASBS Facebook Group

Viewable currently to any member of Facebook;
permission to post by application to administrators.

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Mike Bayly, email: mbayly@unimelb.edu.au

Cover image: *Elaeocarpus sedentarius* Maynard & Crayn.

Leafy twig with clockwise from top: open flower, petal,
sepal, proximal end of fruit, longitudinally sectioned fruit.
Artist: Catherine Wardrop (NSW). With permission of
CSIRO Publishing.

Publication dates of previous issue

Australas. Syst. Bot. Soc. Newslett. 171 (Jun 2017)
ASBS Web site: 8 Aug 2017. Printed version: 18 Aug 2017.

From the President

Council positions

In response to the recent call for nominations for ASBS Council positions, the secretary received one nomination for each of President, Vice President, Treasurer, and Secretary. For the two Councillor positions, however, nominations (three) exceeded vacancies. Electronic voting is now underway. This is the first time such a method has been used and Jen Tate (Secretary and returning officer) has done an excellent job running the electronic ballot, given there is no precedent to guide her! We can confirm that there are no clauses in the ASBS rules that prohibit dual nationals from holding office, so we don't expect any High Court challenges (in either country) to the legitimacy of the outcome. You can, and should, vote with confidence.

Elections for Council positions are rare. Not only is this the first time an electronic ballot has been used, to my knowledge there has only been one previous Council election, in 2008. While they generate a bit of work for the Secretary, elections are a sign of healthy interest by the membership in contributing to the Society. With respect to the current election, I am especially pleased to see nominations of such high quality that span latitudinally the Society's geographical footprint: from Perth (Ryonen Butcher) to Sydney (Hervé Sauquet) and across the ditch to Wellington (Heidi Meudt). It is also encouraging to see strong female representation – as reported in my previous President's report (no. 171) women have been under-represented on Council relative to the underlying membership. Since 1973, 25% of Council positions have been occupied by females (currently there are 33%) and the membership is currently c. 41% female (historical figures not known). The incoming Council will include two (of 6, 33%) or three (50%) females depending on the outcome of voting for the two Councillor positions. Whatever the result, I am sure it will be known a bit more quickly than the recent New Zealand parliamentary election.

ASBS-SASB 2017 conference

Registration and abstract submission are now closed and we are counting down to the start of the conference. Meeting with our 'sister' society, the Society of Australian Systematic Biologists (SASB), is a rare pleasure. The

last such meeting – Sydney 2010 – was a great success and I am sure Adelaide will be even better. Make sure you regularly visit the conference website, systematics.ourplants.org, to keep abreast of developments.

As this will be the final President's report prior to the Adelaide conference, I'd like to remind members of a few things. The Society's Annual General Meeting will be held on Tuesday 28 November from 15:30 to 16:30 at the University of Adelaide; the room will be announced at the conference. This is one of the most important events on the Society's calendar, and the only real opportunity for those you have elected to govern the Society to engage face to face with a broad sample of the membership. I strongly encourage all members to attend and participate – Council certainly would welcome questions, queries and comments from the floor, or privately, on any relevant aspect of Society business. Additionally, there will be a plenary session on the Decadal Plan for Taxonomy and Systematics where an exposure draft of the Plan will be tabled. Much engagement with the community has taken place already, principally through the 'town hall' meetings, but it is hoped that with the release of the draft Plan this engagement will become more targeted. In many ways, this Plan is our best chance for systemic change to secure the future of our discipline and it behoves all of us to contribute meaningfully to its development and implementation. Checking in regularly with the *notobiotica* blog at notobiotica.posthaven.com is a useful way to keep up to date with the development of ideas. For more information and detail see the full report by Kevin Thiele in this newsletter (p. 9).

On behalf of Council, we are very much looking forward to the Adelaide conference and the chance to reconnect with old friends and make new ones. Please, I implore you – if you haven't met a member of your governance team, do introduce yourself at the conference. We would love to meet you and hear what the Society means to you and how it can better serve you now and in the future. Often, these conversations are easier to have one-on-one than in plenary at an AGM.

Darren Crayn

ASBS Inc. business

Election for Council closing 13th November

The call for Council members this year resulted in three members nominating for two available Councillor positions for 2017-2018. The membership is now invited to vote for two Councillors to fill these positions for the coming year. You have the option to vote online, in which case, each member will receive an email directing you to the voting site, or by paper ballot. The latter is attached to this email and can be returned to the secretary at the address on the ballot. The final votes must be received by the Secretary no later than 13 November 2017. All votes will remain confidential and known only to the Secretary for counting purposes.

Biographies for the three nominees

Ms Rynonen Butcher

I am a Research Scientist at the Western Australian Herbarium (PERTH) currently employed through a three year ABRIS grant (NTRGP 2017–2020) to conduct collaborative alpha taxonomic research on the large legume genus *Tephrosia* (Fabaceae: Millettieae) in Western Australia and the Northern Territory. This project aims to describe the c. 40 known informally-named taxa, revise the c. 50 named taxa and resolve problematic taxon boundaries in *T. rosea*, produce an eFlora treatment of the genus for WA and the NT, and a key for the genus Australia-wide. My previous research has concentrated on the biodiverse flora of the South Western Australian Floristic Region, where I have developed specialist knowledge in Elaeocarpaceae (*Tetratheca*, *Platythea*, *Tremandra*), Proteaceae (*Synaphea*) and Fabaceae (*Sphaerolobium*, *Mirbelia*). I am a currently serving ASBS councillor (2016–2017) and a proud advocate of gender equality in science.

Dr Heidi Meudt

I received my PhD from the University of Texas at Austin, USA in 2004, and was subsequently

a postdoctoral fellow at Massey University, Palmerston North, New Zealand. Since 2006 I have been a Research Scientist (Botany) at the Museum of New Zealand Te Papa Tongarewa in Wellington, New Zealand, where I use statistical analyses of morphological and molecular data in an integrative systematics framework to study the taxonomy, phylogeny, classification and species limits of native New Zealand flowering plants. My specific taxonomic focus is New Zealand Plantaginaceae and Boraginaceae and their relatives in the Southern Hemisphere. From 2012 to 2014 I was an Alexander von Humboldt Experienced Researcher at the University of Oldenburg, Germany; I am also a Fellow of the Linnean Society. I am keen to be more involved in ASBS as Councillor and strengthen trans-Tasman ties within the society.

Dr Hervé Sauquet

I am an evolutionary biologist and systematic botanist with a broad interest in macroevolution. A key focus of my research is to unravel and better understand large-scale patterns in the evolution of flowers, combining molecular phylogenies and databases of plant morphology. I obtained my PhD in 2003 in Paris, worked as a postdoc in Stockholm, Sydney, and Kew, then as an Associate Professor at Université Paris-Sud from 2009 to 2017. I just moved to a new position at the Royal Botanic Gardens and Domains Trust in Sydney and am eager to get involved with the Australian botanical community and serve ASBS. I have been a member since 2006, am serving on the editorial boards of Scientific Reports and Taxon, and coordinated the production of a large MOOC on botany.

Website: www.sauquetlab.org.

Jen Tate
ASBS Secretary

Eichler Research Fund reports

New Zealand *Myosotis* (Boraginaceae)

Jessie Prebble

Allan Herbarium, Lincoln

New Zealand has over 40 native species of forget-me-nots (*Myosotis*; Boraginaceae), about two thirds of which are threatened or at risk. The genus is also in need of taxonomic revision, with numerous putative taxa identified.

In 2012 the Australasian Systematic Botany Society awarded me the Eichler grant to help fund forget-me-not field work in the northern South Island of New Zealand. This supported my PhD research into the population genetics and taxonomy of the pygmy forget-me-not group, which I completed last year (Prebble 2016). The grant helped me to travel to 18 locations over as many days during the 2012/2013 summer, from 2200 m a.s.l. on Mt Tapuae-o-Uenuku in the Kaikoura Ranges of Marlborough, to the botanically diverse Mt Arthur in the Kahurangi National Park (Fig. 1a, b), and down to sea-level at Farewell Spit in northwest Nelson (Fig. 2a). I had already completed field work in other parts of New Zealand, and these trips helped to fill in some important collection gaps.

Over the course of the Eichler funded field work I collected from 22 populations of 10 *Myosotis* species and putative taxa. The voucher specimens collected were lodged at WELT, while the leaves collected onto silica were ground up and their DNA extracted, then

genotyped using microsatellite markers that I developed using next-generation sequencing (Prebble et al. 2015). Collected seeds were grown on in a common garden (Fig. 2b). Growing the plants revealed high levels of morphological plasticity, which has likely been contributing to the taxonomic difficulties in this group.

When I started working on the pygmy forget-me-nots, this group of morphologically-similar species consisted of five named species: *M. antarctica*, *M. brevis*, *M. drucei*, *M. glauca*, and



Fig. 1. a (top), pygmy *Myosotis*, Mt Arthur, ph. J. Prebble.

b, Jessie and Lesley Bagnall (Mum), Mt Arthur, ph. Mark Prebble (Dad);

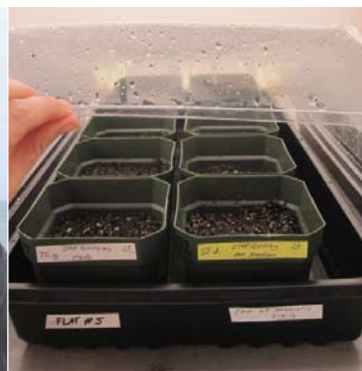


Fig. 2, a (left), Jessie and Lesley, coastal North-west Nelson, ph. M. Prebble; b, Common garden, Day 1 Massey University, Palmerston North, ph. J. Prebble.

M. pygmaea. In addition, a number of putative taxa had been identified, with unclear affiliation to the pygmy forget-me-not group. The field trip up Mt Tapuae-o-Uenuku allowed for the collection of one such putative taxon for the first time since the 1980s (Fig. 3). The access to that site comprised an exciting day of walking up a river, staying in a tiny hut, followed by another day of scree scrambling, all in search of some rather lovely little plants.

The results of my thesis are in the process of being published as four separate papers, with one paper published (Prebble et al. 2015), one on the way (Prebble et al. under review at *Systematic Botany*), and others to be submitted soon. The population genetic dataset of over 500 genotyped individuals showed low within and high between genetic variation, which supports the idea that these species usually self-fertilise, as well as pointing towards low levels of dispersal. The final chapter in my thesis is an integrative taxonomic revision of the pygmy forget-me-nots, complete with ecological niche modelling, descriptions, a key, maps, and suggested conservation status updates. There is morphological and genetic evidence to continue recognising some but not all of the pygmy forget-me-nots at species level, but you'll have to wait for the publication to find out who makes the cut!

Myosotis brevis and *M. glauca* are the two most threatened pygmy forget-me-nots. We are particularly concerned about the North

Island populations of *M. brevis*, which inhabit coastal turf ecosystems that are themselves threatened. Populations that were surveyed as recently as 2005 have been destroyed by goat browsing, and in some locations that we visited the cliff top turfs are eroding into the ocean. The field work over the course of my thesis has contributed to our knowledge of population size and persistence for all of the pygmy forget-me-nots, which has fed through to their threat status as managed by the Department of Conservation.

My thesis was able to resolve the status of some putative taxa, whereas others required comparison with additional species outside the pygmy group. Luckily (well OK, it may have been planned) Heidi Meudt was already working on the remainder of the bracteate-prostrate Southern Hemisphere *Myosotis*, and we were able to make those comparisons. For example, regarding the putative taxon from Mt Tapuae-o-Uenuku, we found that although it is easily distinguishable both morphologically and genetically from all of the pygmy forget-me-nots including one it grows in sympatry with, it is indistinguishable from a different species of New Zealand *Myosotis*. The details about this will be available soon in a journal near you (Meudt and Prebble, under review at *Australian Systematic Botany*).

Many thanks to the ASBS for supporting this research, and to all of the people who helped out with field work along the way (there were

so many people!). I particularly want to thank my supervisors, who continued to encourage me the whole way through (Vaughan Symonds, Jen Tate and Heidi Meudt), and the Museum of New Zealand Te Papa Tongarewa who hosted me for much of my studies.

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Prebble JM, Tate JA, Meudt HM, and Symonds, VV. 2015. Microsatellite markers for the New Zealand endemic *Myosotis pygmaea* species group (Boraginaceae) amplify across species. *Applications in Plant Sciences* 3(6):1500027. DOI: <http://dx.doi.org/10.3732/apps.1500027>

Prebble JM, Meudt HM, Tate JA, and Symonds, VV. Bolstering Species Delimitation in Difficult Species Complexes by Analyzing Herbarium and Common Garden Morphological Data: A Case Study using the New Zealand Native *Myosotis pygmaea* Species Group (Boraginaceae). Under review at *Systematic Botany*

Meudt, HM and Prebble JM. Species limits and taxonomic revision of the bracteate-prostrate group of Southern Hemisphere forget-me-nots (*Myosotis*, Boraginaceae) including description of three new species endemic to New Zealand. Under Review at *Australian Systematic Botany*.

Fig. 3. From top: a, Jessie, Micheline Evans and Charlie Devonish on way up Mt Tapuae-o-Uenuku. ph. A. Packard; b, Putative *Myosotis* taxon, Mt Tapuae-o-Uenuku, ph. J. Prebble.



Using next-generation sequencing to explore diversity in the *Triodia basedowii* species complex

Benjamin Anderson (banderson2914@gmail.com)

Species complexes are, as their name suggests, difficult to sort out. The taxonomically frustrating fuzzy nature of relationships between closely-related species almost makes finding that new variant in the field a bit of an “oh no” moment. Just when we think we have found that set of characters that neatly distinguishes two species, we encounter the exception. While not a final solution to the challenge of delimiting evolutionary diversity, newer molecular approaches utilising next-generation sequencing (NGS) offer an additional tool for frustrated taxonomists to use in dissecting the complex relationships in species complexes.

During my PhD in Perth, I studied a species complex of perennial hummock grasses (*Triodia* R.Br.) with much of its diversity in Western Australia (WA) (Figs. 1, 2). These grasses (commonly called “spinifex”) are widespread across Australia and prevalent in the arid interior, where they are often structurally dominant components of the vegetation and provide habitat and food for a variety of animals. The group I studied comprised unnamed species allied to *Triodia*

basedowii E.Pritz. and *T. lanigera* Domin, with two already recognised with phrase names prior to the start of my work. Biological surveys and field identification, particularly in the Pilbara region of WA, repeatedly encountered difficulties applying the two existing names (*T. basedowii* and *T. lanigera*) to specimens, suggesting there was a need to look more closely at this group.

After field study and initial morphological and genetic work (published in Anderson et al. 2016), it was becoming clear that there were more than two or three species in the group. Based on this more traditional approach, there was evidence for multiple entities in the Pilbara that were strongly demarcated geographically, but the initial dataset showed signs of conflict between markers and between morphology and molecular signals, as well as indications of hybridisation. To better sort out relationships between the putative taxa and to get a sense of genomic divergence between them, my supervisors and I decided to explore an NGS approach called genotyping-by-sequencing (GBS; Elshire et al. 2011, Grabowski et al.



Fig. 1. Ben examining *Triodia* sp. Warrawagine, soon to be described.
Ph. M. Barrett



Fig. 2. Ben in a ring of *Triodia basedowii*.

Ph. K. Thiele

2014).

In 2014, I received funding from the Hansjörg Eichler Scientific Research Fund to put toward the sequencing of additional samples. In total, 157 samples (more than 1.5 plates) were submitted for sequencing to the Australian National University Biomolecular Resource Facility, ~38 (one quarter) of which were possible because of the Eichler grant. Sequencing was completed by mid-2015, and then began a not-inconsequential period of analysis, which included learning how to use the bioinformatic tools necessary to properly analyse a dataset of that size. Of the 157 samples submitted, 136 were successfully sequenced to an adequate depth, resulting in roughly 4.5 million reads per sample. These were assembled into tens of thousands of loci per sample, from which I was able to create alignments and call variants for phylogenetic analyses and for assessing genomic divergence.

The primary GBS results with implications for the taxonomy of my group (published in

Anderson et al. 2017a) broadly supported the distinction of most of the entities previously found using morphology and genetic markers, and provided a new estimation of relationships between those entities. The GBS results strengthened support for one species recognised by morphological but not genetic differences by showing a large amount of genomic divergence from its close relative. The results also helped to support the distinction of a new species discovered after the earlier traditional work had been completed. I presented some of the implications of the GBS results for relationships in the complex as well as for analytical approaches to NGS datasets at the 2015 ASBS annual conference in Canberra.

One of the important benefits of integrating multiple lines of evidence (morphological, genetic, genomic) in systematic work on complex groups is that these different perspectives on evolutionary divergence provide for better insight into the processes and history that have shaped current diversity. One of the outcomes from the GBS work has been

to shed light on the demographic history of *Triodia basedowii* (hopefully published soon), with evidence for a recent range expansion from central Australia (surprisingly not from the Pilbara, where most of the diversity in the group is) probably concurrent with the expansion of sandy deserts in the last one million years. The integration of multiple lines of evidence also makes the taxonomic output more robust, and part of the output from this genomic work is support for the recognition of eight new species of *Triodia* (soon to be published: Anderson et al. 2017b).

Support from the Hansjörg Eichler Scientific Research Fund substantially improved the outcomes from the GBS work I undertook, which became a key component in my PhD and has broadened my experience in NGS techniques and analyses. I am grateful for the support of the society through this funding scheme and for the support I received at the ASBS conferences I attended throughout my time in Australia.

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- Anderson BM, Thiele KR, Krauss SL, Barrett MD (2017a) Genotyping-by-Sequencing in a Species Complex of Australian Hummock Grasses (*Triodia*): Methodological Insights and Phylogenetic Resolution. *PLoS ONE* 12, e0171053.
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- Grabowski PP, Morris GP, Casler MD, Borevitz JO (2014) Population genomic variation reveals roles of history, adaptation and ploidy in switchgrass. *Molecular Ecology* 23, 4059–4073.

Anderson BM, Barrett MD, Krauss SL, Thiele KR

A postscript

Current Lucid keys

Triodia of the Pilbara – *SpiKey*

Ben Anderson has also been involved in the development of a new app for identifying *Triodia* species from Western Australia's Pilbara region. Known as *SpiKey*, the guide covers 28 species and one hybrid (about a quarter of the species in *Triodia*), and includes many newly recognised species. It is available free of charge as a web version (Web ref. 1) and in mobile format for Android and iOS through the App Store.

SpiKey is co-authored by Matt Barrett (Kings Park Science), Ben Anderson (recent PhD graduate of The University of Western Australia) and Kevin Thiele (UWA). [adapted from Western Australian Herbarium Facebook page at Web ref. 2).

Accessing available Lucid keys – a global resource

If you haven't visited the Lucid pages (Web ref.

3) recently you will probably be surprised at the number of keys available, many of them for commercial purposes overseas (e.g. Web ref. 4 and covering the whole gamut of biodiversity. Unfortunately we were too late to advertise the recent Canberra workshop but note that Lucid 3.3 is presently being offered free of charge through the Lucid website and that there are new releases in Lucid 3.6 and Fact Sheet Fusion 2.

Web references

1. <http://keys.lucidcentral.org/keys/v3/triodia/>
2. <https://www.facebook.com/WesternAustralianHerbarium/photos/pb.254289827948229.-2207520000.1497741283./1427850067258860/?type=3>
3. <http://keys.lucidcentral.org>
4. www.idtools.org/identify.php

Robyn Barker

Current affairs in systematics

The Decadal Plan for Taxonomy and Biosystematics in Australasia

Kevin Thiele

Program Manager, Biosystematics and Taxonomy Plan
Australian Academy of Science

Significant progress has been made towards the development of a decadal plan for taxonomy and biosystematics in Australasia since the last ASBS Newsletter, and particularly since we were successful in our funding bid to the Ian Potter Foundation. In brief:

The Taxonomy 2028 Challenge (launched in this Newsletter in July) has been completed, with 20 contributions to the *noto|biotica* blog at <http://notobiotica.posthaven.com/>, mostly from early career researchers and students (if you haven't already done so, these are well worth reading, along with the other decadal plan contributions on the site). The perspectives, ideas and visions contributed through the Challenge have been very helpful to the project's Working Group in formulating our strategic vision for the decade.

The project's Working Group, now comprising 36 members, has met fortnightly since June, an heroic collective effort that has ensured good representation and wisdom from across the biotic spectrum of our community. The addition of the most recent member, Prof. Phil Hugenholtz (nominated by the Australian Society for Microbiology) has finally given us expertise in the prokaryotes, a group that has not been well represented till now.

The project's Advisory Committee has met for the first time and has begun planning for the implementation and advocacy phase of the project, which will commence in the lead-up to, and following, the release of the plan in early 2018. The Advisory Committee comprises Dr Judy West, Department of the Environment and Energy (Chair), Prof. Craig Moritz, Centre for Biodiversity Analysis, ANU, Prof. Pauline Ladiges, Academy of Science and The University of Melbourne, Dr Tom Trnski, Auckland War Memorial Museum, and Dr Wendy Nelson, NZ National Institute of Water and Atmosphere.

A "town hall" style meeting has been held in every capital in Australia (with video links for participants in Alice Springs, Cairns and Townsville). These meetings were collectively

attended by approx. 330 people from across the sector and from key stakeholder groups. Break-out discussions at these meetings contributed a vast array of visions, issues, ideas and perspectives, which together comprise a key resource in formulating a proposed consensus vision for our community. As one would expect, common themes quickly emerged from these meetings; but each also threw up important new ideas. The prize for most novel idea has got to go to the Darwin meeting, with the suggestion that in the next decade the taxonomy and systematics community in Australasia should prepare for the discovery of alien life on new planets (or was it alien life visiting our planet – I can't remember). A key detail of exactly how we should prepare was omitted; the Working Group will need to consider this.

Next steps are a series of "town hall" meetings in Christchurch, Auckland and Wellington to ensure that New Zealand perspectives are well-represented, then many, many further conversations while we wrap up the plan ready for discussion at the Adelaide ASBS/SASB meeting, and final release in the first quarter of 2018.

I need to say that I very much appreciate the enormous amount of both work and goodwill that has gone into this initiative, firstly over several years from members of the Working Group, then more recently by the expanded Working Group, the Academy and Royal Society Te Aparangi, and all participants at the town hall meetings and contributors to *noto|biotica*. I believe there is a shared sense in the community that we need to be more strategic if we are to meet our ultimate objective of increasing the profile, recognition, status and funding for our discipline. A shared vision has emerged from all the many interactions I've had with community members and with stakeholders; that vision will be clearly stated in the plan, and I believe will give us our best shot at a successful, productive and reinvigorating decade.

News

New Zealand Science Review

In 2016 a whole issue of the journal *New Zealand Science Review* (Web ref.), official journal of the New Zealand Association of Scientists, was dedicated to the state of New Zealand systematics. Papers in the issue were those presented at a one day symposium “Systematics and Biodiversity: Past, Present and Future” held in Wellington in April 2016 under the auspices of the National Institute of Water & Atmospheric Research. Heidi Meudt’s paper “Integrative, next-generation, collaborative vascular plant systematics in New Zealand” is one of a number of papers on the state of play of systematics within different organisms (e.g. fish, freshwater insects, bryozoans etc), together with a consideration of the national collections and databases, the changes in the science field, and addressing whether there really is a taxonomic crisis.

The entire issue can be downloaded free as a pdf from Web ref. 1 and is relevant to the Australasian review presently taking place. There are issues of relevance in other volumes of the journal, too. So have a look at the home page of the journal to access these.

Web ref. [http://scientists.org.nz/files/journal/2016-73/NZSR73\(3-4\).pdf](http://scientists.org.nz/files/journal/2016-73/NZSR73(3-4).pdf)

NZ Loder Cup to Peter de Lange

Congratulations to Peter de Lange, recipient of the 2017 Loder Cup (Web ref. 1), awarded to individuals and groups who make a significant contribution to plant conservation work in New Zealand. An image of Peter with the impressive cup can be seen at Web ref. 2. Peter is in some great company when you look at past recipients of this award, first instituted in 1929.

Web ref. 1. www.doc.govt.nz/news/events/awards/loder-cup-award/

Web ref. 2. www.doc.govt.nz/news/events/awards/loder-cup-award/2017-winner/

Coincidentally there has just appeared in my email box the announcement of the NZ Arboricultural Association Ronald Flook Award to Helen Lowe of Christchurch. I’m not aware that this lady has anything to do with our field but last year she managed to ensure protection for 1500 heritage and notable trees

in Christchurch, a significant retention indeed for this post-earth-quake garden city.

Careers advice for junior scientists

The Editorial in the 25th October 2017 issue of *Nature* (Web ref. 1) would be rather dispiriting if you are an early career scientist but it is not really saying anything we are not all aware of – hence the Systematics workshops that many of you will have attended recently. However, as well as documenting some negative experiences, there are also some encouraging stories indicating that employment need not be confined to academia and there are some suggestions in the six articles in the same issue which might be helpful, particularly the one on Flexible working (Web ref. 2). Just hearing the stories of others may well help in making decisions about future directions (Web ref. 3), particularly when getting grants is based on old fashioned “publish or perish” ideas (Web ref. 4).

Web references

1. <https://www.nature.com/news/many-junior-scientists-need-to-take-a-hard-look-at-their-job-prospects-1.22879>
2. www.nature.com/naturejobs/science/articles/10.1038/nj7676-419a
3. <https://www.nature.com/news/young-talented-and-fed-up-scientists-tell-their-stories-1.20872>
4. <https://www.nature.com/news/let-researchers-try-new-paths-1.20857>

Fresh Science for early career researchers

Fresh Science is a national competition helping early-career researchers find, and then share, their stories of discovery. The program takes up-and-coming researchers with no media experience and turns them into spokespeople for science, giving them a taste of life in the limelight, with a day of media training and a public event in their home state. [From the website].

There are not too many systematic projects included here if you look at the stories on the website so far and unfortunately it is too late for this year since most events are being held about now. Nor is there any information presently available on their website for 2018 but don’t let that stop you finding an angle for

your research and being ready to present it and promote your abilities next year.

Web ref. <http://freshscience.org.au/>

Australian Systematic Botany Student Prize

Congratulations to Elizabeth Sheedy who has been awarded the 2016 *Australian Systematic Botany* annual Student Prize for the best student-authored paper published in the journal. Elizabeth was the lead author in the paper, Sheedy et al., 2016, which is Open Access.

Her interests are broadly in the evolution and ecology of mushrooms, predominately at the level of species and population variation. However, she was excited to look a bit deeper into the evolution of a particular fruit-body form during her PhD, which included working with well-respected mycologists from Australia, the USA and Sweden, and which culminated in a fascinating paper published in *Australian Systematic Botany*. She has since worked at the National Museum of Nature and Science in Japan on introduced populations of mushrooms, and is currently working for Marcroft Grains Pathology in Horsham, on fungal pathogens of canola crops.

Thanks to Dr Brietta Pike of CSIRO Publishing for providing this information.

Reference

Sheedy, E.M., Ryberg, M., Lebel, T., May, T.W., Bougher, N.L. & Matheny, P.B. 2016). Dating the emergence of truffle-like fungi in Australia, by using an augmented meta-analysis. *Australian Systematic Botany* 29(5): 284–302. <https://doi.org/10.1071/SB16025>

This year's Margaret Flockton awards

The new book on Margaret Flockton published in the last year (see p. 37) served as a reminder of the annual award in her name (Web ref. 1) for scientific botanical illustrations. This year all of the works had to be submitted digitally and instead of the original artwork, as in the past, high quality prints were exhibited. Winner of this year's competition was Lucy Smith from Kew with her illustration of a new species of climbing palm, *Calamus pintauidii* W.J.Baker & J.Dransf., for the Palms of New Guinea Project (Baker & Dransfield 2017). Second prize went to Esmee Winkel of Leiden, while two Highly Commended awards went to Juan Luis Castillo from Spain and one to Rogerio Lupo of Brazil.

All of these works are available on the web site and some further background to this year's exhibition, including the information that the Castillo works had been created on a tablet, can be seen in an article in the *Australian Geographic* (Web ref. 2).

References

Baker, W.J. & Dransfield, J. (2017). More new rattans from New Guinea and the Solomon Islands (*Calamus*, *Arecaceae*). *Phytotaxa* 305(2): 61–86. <https://doi.org/10.11646/phytotaxa.305.2.1>

Web ref. 1. <https://www.rbgsyd.nsw.gov.au/Science-Conservation/Botanical-Illustration/The-Margaret-Flockton-Award>

Web ref. 2. www.australiangeographic.com.au/news/2017/05/margaret-flockton-2017-digital-illustrations

Expedition returns from sunken Zealandia

A team of scientists has completed a nine-week voyage to study the newly-recognised, submerged continent, Zealandia (Web ref.). The scientists from the International Ocean Discovery Program (IODP) drilled deep into the seabed at six sites in water depths of more than 1,250 meters. They collected 2,500 meters of sediment cores from layers that record how the geography, volcanism and climate of Zealandia have changed over the last 70 million years. Until now, the region has been sparsely surveyed and sampled.

Significant new fossil discoveries indicate that Zealandia was not always as deeply submerged as does the discovery of microscopic shells of organisms that lived in warm shallow seas, and of spores and pollen from land plants.

Web ref. https://www.nsf.gov/news/news_summ.jsp?cntn_id=243192

2017 Photomicrography Competition

Always fascinating, take a look at the entries and winners in this year's photomicrography competition.

Web ref. www.nikonsmallworld.com/galleries/photo/2017-photomicrography-competition

New Zealand elections and the Te Papa blog

With New Zealand in election mode, Leon Perrie tackled the topic of voting for the environment from the perspective of the museum for the Te Papa blog (Web ref.). Others tackled the topics of education, immigration, housing and the economy. Leon's article is

nothing to do with politics but a very readable state of environment piece pointing out some hard facts but tempering with some positives. It will be interesting to see how the new government treats this important portfolio.

Web ref. <http://blog.tepapa.govt.nz/2017/09/19/election-2017-voting-for-the-environment/>

Unveiling of portrait of Pauline Ladiges

Mike Bayly posted the following on FaceBook on 4th September.

Today we had a small celebration for the unveiling of a portrait of Prof. Pauline Ladiges, long-time head of the School of Botany (1992–2010) [at Melbourne University], eucalypt expert, inspirational teacher, and mentor to a generation of local plant systematists. The portrait by Tom Alberts (right) is hanging in the Turner Theatre in the Botany building (BioSciences 2) [Fig. 1]. Although officially "retired", Pauline remains very active in supporting the herbarium, the School of BioSciences, and in nation-wide educational programs through her role as Secretary for Education and Public Awareness of the Australian Academy of Science. A quick

google will tell you more about Pauline and her impressive career.

A new checklist of NZ flora

The latest of the rapid rate of publications on the New Zealand flora emanating from the Allan Herbarium is a new census of the country's flora, covering indigenous and naturalised seed plants.

Taxa listed are those that are present in the wild flora in the New Zealand political region, including exotic cultivars. Hybrids are included only if one of the parental taxa is missing from the wild flora, or the hybrid is recorded as naturalised. Misapplications and tag names are excluded from the Checklist.

Reference

Schönberger I., Wilton A.D., Boardman K.F., Breitwieser I., Cochrane M., de Lange P.J., de Pauw B., Fife A.J., Ford K.A., Gibb E.S., Glenny D.S., Korver M.A., Novis P.M., Prebble J.M., Redmond D.N., Smissen R.D., Tawiri K. (2017) *Checklist of the New Zealand Flora – Seed Plants*. Lincoln, Manaaki Whenua-Landcare Research. <http://dx.doi.org/10.7931/P1D33B>

Fig. The Pauline Ladiges portrait at Melbourne University with subject and artist.

Ph. M. Bayly



ABRS report

Staff updates

Zoe Knapp returned from maternity leave in September. Russell Barrett left in July to take up a position at the Royal Botanic Gardens and Domain Trust, Sydney. Chris Palmer, who replaced Zoe while on maternity leave, continues to work part-time assisting with data management in the Australian Faunal Directory. Glen Cook commenced in June as the new ABRS grants manager, replacing Eleanor Hearder. Tony Orchard continues to provide volunteer editorial support for the *Flora of Australia*.

An electronic *Flora of Australia*

The *Flora of Australia* (FoA) is now available online (Web ref. 1) on an interactive eFlora platform. Initiated as a collaborative project between the Council of Heads of Australian Herbaria, ABRS and the Atlas of Living Australia (ALA), successful delivery of an electronic FoA is the result of a momentous collaborative effort among taxonomists in Australia and New Zealand. The ABRS is grateful for the contributions of everyone involved in the project, particularly Kevin Thiele for his continued leadership and support and Russell Barrett for his work on manuscripts.

The electronic FoA was informally launched at the International Botanical Congress in China in July 2017, and the ABRS plans to hold a formal launch at the upcoming Systematics Conference in Adelaide in November. The ALA will address some outstanding functionality issues and bug fixes prior to the formal launch.

Approximately 14 000 taxon profiles are now available, including treatments previously published in the hard copy series, with nomenclatural updates to be made progressively. Nearly 500 taxon profiles new to the FoA have been added in draft form (not publicly accessible) and will be progressively published. These include parts of *Amaranthaceae*, *Euphorbiaceae*, *Hypericaceae*, and *Scrophulariaceae*. Taxon profiles were developed from treatments previously provided to the ABRS for publication in planned, but unpublished, FoA volumes. The ABRS is currently developing contributor guidelines and user support is available online (Web ref.

2). The ABRS welcomes any feedback on the electronic FoA, including the content, platform functionality and suggestions that may inform development of contributor or user guidelines and support.

Priorities for new contributions of vascular plant taxa to the FoA are outlined on the ABRS website (Web ref. 5, and refer to 'Grants' section below).

Fungi of Australia

The new volume covering Australian *Inocybaceae* (P. Brandon Matheny, Neale L. Bougher) has been published and is available from CSIRO Publishing (Web ref. 3).

Grants (unfortunately now closed)¹

The 2018–19 National Taxonomy Research Grant Programme (NTRGP) Research Grants and Capacity-Building Grants rounds are now open. Applications close 2pm (AEDT) on Thursday 2 November 2017. More information is available on the ABRS website (Web ref. 4).

Please note that for the 2018-19 NTRGP grants round, funding for vascular plant groups will be prioritised towards taxa listed in the Final Priority Plant Taxa List for projects relating to the *Flora of Australia* (Web ref. 4).

The Bush Blitz Tactical Taxonomy grants are currently open and close on 16 October. More information is available on the Bush Blitz website (Web ref. 5).

Bush Blitz

Bush Blitz has completed 3 expeditions in the last 6 months, to the Bradshaw Military Training Area in the NT, Lake Mungo National Park in NSW and the Great Victoria Desert in SA.

Web references

1. www.ausflora.org.au
2. <https://ausflora.net/>
3. www.publish.csiro.au/book/7650/
4. www.environment.gov.au/science/abrs/grants/
5. www.bushblitz.org.au/grants

Zoe Knapp & Anthony Whalen
ABRS, September 2017

¹ We apologise that the Newsletter was not published before these closing dates. Eds

Another postscript

Global online Floras

Further to the on-line *Flora of Australia* the following sites show two global electronic floras which are in their early stages.

Plants of the World Online (POWO)

On 3 April 2017, the Royal Botanic Gardens, Kew, in London launched Plants of the World Online (Web ref. 1), a project that it hopes will include information on all the world's known seed-bearing plants by 2020.

This e-resource will be a single point of access for authoritative information on plant species, from anywhere in the world. It will provide a multi-dimensional catalogue of plant life, including information on identification, distribution, traits, threat status, molecular phylogenies and uses. It will use Kew's extensive data resources alongside images from the digitisation of the collections.

This one-stop portal will enable dissemination of plant information at levels accessible to all. The UK flora is extremely well known, and POWO will consolidate the wealth of information on UK species in a dedicated UK portal. In addition, we will start to build a similar online repository for UK fungal collections and will provide the knowledge and support for partners in other countries to set up their own portals, which can be linked through to Kew.

This will ultimately lead to a resource that has global coverage, linking directly through to the taxonomic framework provided by the World Flora Online (Web ref. 2), which aims to provide an online taxonomic resource for all

known plants. [Adapted from website.]

World Flora Online (WFO)

This is a related project run by an international consortium which aims eventually to create a full inventory of all plant life (Web ref. 2). Australia is represented through ABRS.

In 2010, the updated Global Strategy for Plant Conservation (GSPC) of the U.N. Convention on Biological Diversity included as its first target the need for "An online flora of all known plants." In January 2012 representatives from the Missouri, the New York, the Edinburgh and the Kew Botanic Gardens, took the initiative to meet and discuss how to achieve this target by 2020. The meeting resulted in a proposed outline of the scope and content of a World Flora Online, as well as a decision to form an international consortium of institutions and organizations to collaborate on providing that content.

The World Flora Online project was launched in India in October 2012. In January 2013 a Memorandum of Understanding on the World Flora Online, was opened for signature. By August 2014, 24 institutions and organizations had signed the MOU. A range of other institutions and organizations worldwide is also being invited to participate in the WFO Consortium.

The World Flora Online will be an open-access, Web-based compendium of the world's plant species. It will be a collaborative, international project, building upon existing knowledge and published floras, checklists and revisions but will also require the collection and generation of new information on poorly known plant groups and plants in unexplored regions. [Adapted from website]

Web references

1. www.plantsoftheworldonline.org/
2. www.worldfloraonline.org/

Robyn Barker
State Herbarium of South Australia

*ASBS Council
election*

Cast your vote NOW!

See p. 2 for details.

Votes must be received by the
Secretary no later than 13 November 2017

Conference reports

XIX International Botanical Congress in Shenzhen, 17–29 July 2017

Karen Wilson

National Herbarium of NSW, Royal Botanic Gardens and Domain Trust, Sydney

Shenzhen adjoins Hong Kong and receives little more than a few sentences in guidebooks about its rapid growth from a cluster of rural villages in 1979 to a high-rise industrial city of more than 11 million people – some sources say as many as 18 million now live or work there on any day. It was developed as China's first Special Economic Zone and has one of the world's busiest container ports. Given what I had read, I was pleasantly surprised with what I found there during the IBC. Even the sky was blue (between storms) for the first week, although the air pollution built up until it was very high by the end of the fortnight.

The city is indeed big and buildings are mostly high-rise and modern (Fig. 1). It was rare to glimpse older buildings less than about 5 stories tall. However, in the areas I visited, most streets were lined with trees and under-planted with kerbside gardens, providing respite from the steamy heat as we walked to the IBC venues. People were friendly but spoke surprisingly little English for such an international centre. Everyone seemed happy to whip out their smart phones and use maps and translations to help. It was useful to have destinations written down when travelling anywhere.

The city administration and Chinese Academy of Science pulled out all stops to ensure the success of the IBC, ranging from a very high level of sponsorship to having about 1300 volunteers at all venues for the fortnight. These were mostly undergraduates (not necessarily studying botany) but the youngest we met was 15 and already super-keen on botany.

The Congress registration fees were much lower than we could afford to charge for the previous IBC in Melbourne, and visitors did not have to contend with a high exchange rate such as we had in 2011. Delegates numbered nearly 7000, the largest number at any Congress so far, with about 2000 from other countries. Security was tight, and everyone had to go through a security check to enter the venues.

Nomenclature

The Nomenclature Section met on 17–21 July (8 a.m–6 p.m.) in the very modern Peking University HSBC Business School, part of the leafy Shenzhen University Town. Despite concerns beforehand about having to cater for very high numbers, in the end a manageable 155 turned up (Fig. 2).

The session was very busy, dealing with 397 proposals plus 16 from the floor - the largest number since the Stockholm Congress in 1950. As usual, the discussions were intense and complicated. Sandy Knapp ably chaired the



Fig. 1. The Convention and Exhibition Centre as seen from our hotel.

Ph. K. Wilson



meeting, with Nick Turland and John Wiersema providing expert nomenclatural guidance as Rapporteurs. Yun-fei Deng and Anna Monro recorded the proceedings (Figs. 2–4), with assistance from Li Zhang on some days. As in Melbourne, Anna had the difficult job of typing in changes to each article as they were suggested for projection on the screen.

See Knapp et al. (2017) and Turland et al. (2017) for more details about the Session and the changes made to the Code. There is a useful list of dates that limit particular rules in the latter reference (on p. 1238). The Shenzhen Code is being prepared by the Editorial Committee for publication in 2018, but note that the changes accepted in Shenzhen took effect from the final plenary session of the IBC on 29 July.



Fig. 2. Session participants with (front row) Bureau of Nomenclature members Anna Monro, John Wiersema, Nick Turland, Sandy Knapp and the six vice-presidents: Renée Fortunato, John McNeill, Werner Greuter, Gideon Smith and Karen Wilson.

Ph. G. Shimizu.

Major decisions included:

1. Setting up a new Permanent Committee for Registration to examine ways to implement registration of plant and algal names (as already being done for fungi).
2. Moving articles affecting only fungal names to a separate chapter; these will be amended by the Fungal Nomenclature Session of the International Mycological Congress (held every four years; next IMC will be in Puerto Rico in 2018).
3. Expanding Division III about governance of the Code, making it easier for everyone to understand how changes are made to the Code and how the various Nomenclature Committees and Special Committees are set up and operate between Congresses.

The Nomenclature Committees for the next six years were appointed on the last day, including various people from our part of the world:

Tom May in the new position of Secretary of the Fungal Nomenclature Bureau for the 11th International Mycological Congress in 2018, also Secretary of the Nomenclature Committee for Fungi, ex officio member of the General Committee and member of the Code Editorial Committee;

Fig.3, Kevin Thiele and Francis Nge at the Nomenclatural Session.

Ph. G. Shimizu



Fig. 4, from left to right: a, Sandy Knapp presiding over the Nomenclature Session with fellow Bureau of Nomenclature members Nicholas Turland, John Wiersema, Anna Monro, Yun-fei Deng. Ph. K. Wilson

David Mabberley (Chair) and Karen Wilson (Secretary) of the General Committee for Nomenclature;

Niels Klazenga (Secretary of the Committee for Bryophytes; ex officio member of the General C'tee);

Bill Woelkerling (Chair, C'tee for Algae);

David Cantrill (member, C'tee for Fossils);

Peter Wilson (member, C'tee for Vascular Plants);

Anna Monro (member, Editorial C'tee);

Pina Milne (member, new C'tee on Institutional Votes);

Ilse Breitwieser and Shelley James (members, new Registration C'tee).

After a very full but successful week, all Nomenclature participants were happy to finish at 5 p.m. on the Friday, leaving us free to sightsee and relax for a day or two. Some of us went to the Fairy Lake Botanical Garden (Fig. 5), which is on the eastern edge of the city (c. 25 km from downtown), and well worth visiting. The Garden is partly natural tropical forest but with specialist plantings spread around its 546 mountainous hectares.

Fig. 5. Tanja Schuster under a Cycas plant, Fairy Lake Botanical Garden.

Ph. K. Wilson





Fig. Cyperologists gather at the green wall at the entrance to the Congress Centre, including Jeremy Bruhl, Russell Barrett and Karen Wilson. Ph. Martin Lechowicz

The national cycad collection is there, for example, and a 'petrified forest' of fossilised tree trunks stands next to a dinosaur museum.

Registration for the IBC was spread over the weekend because of the high numbers and ended with the IBC welcome reception on the Sunday evening: a spectacular show of Chinese music, dancing and acrobatics.

The main proceedings

The main Congress was held 23–29 July in the enormous Convention and Exhibition Centre adjacent to the city centre. Big as it was, with up to 28 parallel sessions each afternoon, some sessions had to be held in a hotel a few blocks away. The symposia covered the usual broad range of topics and (also as usual) one often found talks of particular interest being presented at the same time. Vicki Funk describes activities (Funk 2017) and I won't repeat all that she wrote – this and the other references below are all freely accessible in Taxon on the Ingenta site (Web ref.). One of Vicki's favourite features (and mine) was a spectacular green wall at the top of the long flight of stairs at the entrance, and several other green walls made and sponsored by a local company.

The final plenary session included two major awards. The Engler Medal in Gold for plant systematics research, awarded by the International Association for Plant Taxonomy at each IBC, went to the eminent Chinese botanist Prof. Hong De-yuan. The Chinese announced a Shenzhen International Award in Plant Sciences. The inaugural award of this went to Dr Peter Raven, who gave his usual inspiring speech about the need for conservation and research to guide it.

The venue for the XX IBC is Rio de Janeiro in July 2023; so start saving your pennies and learning the salsa.

References

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- Turland NJ, Wiersema JH, Monro AM, Deng Y-F, and Zhang L (2017) XIX International Botanical Congress: Report of Congress action on nomenclatural proposals. *Taxon* 66: 1234–1235. <https://doi.org/10.12705/665.16>
- Web ref. www.ingentaconnect.com/content/iapt/

IBC outcomes: the Shenzhen Declaration for Plant Sciences

One further outcome from the Shenzhen conference was the Declaration for Plant Sciences which recognizes the increasing pace of change in so many aspects of the world and the need for collaborative solutions to maintain a green sustainable world. Seven priorities for strategic action in the plant sciences have been expressed

- To become responsible scientists and research communities who pursue plant sciences in the context of a changing world.
- To enhance support for the plant sciences to achieve global sustainability.
- To cooperate and integrate across nations and regions and to work together across disciplines and cultures to address common goals.
- To build and use new technologies and big data platforms to increase exploration and understanding of nature.
- To accelerate the inventory of life on Earth for the wise use of nature and the benefit of humankind.

- To value, document, and protect indigenous, traditional, and local knowledge about plants and nature.
- To engage the power of the public with the power of plants through greater participation and outreach, innovative education, and citizen science.

The full text of the Shenzhen Declaration has been published in both the open access journal *PhytoKeys* and the *Journal of Systematics and Evolution*, referenced as follows.

References

- Shenzhen Declaration Drafting Committee (2017). The Shenzhen Declaration on Plant Sciences – Uniting plant sciences and society to build a green, sustainable Earth. *PhytoKeys* 86: 3–7. <https://doi.org/10.3897/phytokeys.86.20859>
- Song Ge & Jun Wen (2017). The XIX International Botanical Congress, the Shenzhen Declaration on Plant Sciences, and the Resolutions of IBC 2017. *JSE Journal of Systematics and Evolution* 55(5): 411–414. doi: 10.1111/jse.12284

Genomics and Collections conference in Canberra, 12–14 September 2017

Alexander N. Schmidt-Lebuhn
CSIRO, Centre for Australian National Biodiversity Research, Canberra

From 12 to 14 September 2017 the conference Genomics and Collections: Adaptation to Macroevolution took place at CSIRO Discovery in Canberra (Web ref. 1). It was at the same time the annual conference of the Centre for Biodiversity Analysis (CBA), a CSIRO-ANU joint venture dedicated to collection science, biodiversity research, genomics and bioinformatics, and a CSIRO Cutting Edge Symposium, jointly organised by CBA director Craig Moritz and the director of the Australian National Wildlife Collection, Leo Joseph.

The main topic of the conference was the interface of collection science and genomics, as described by the organisers: “How can we best tap the genomic potential in the millions of specimens held in collections worldwide? How do we enhance the analytical power of thousands rather than tens of loci for systematics and population genetics? How might we study

temporal diversity in collections?” The program constituted a mixture of 30 min long invited talks, 15 min long regular talks, and 5 min long lightning talks, as well as posters associated with the latter.

Talks were extremely diverse, ranging from laboratory methods across bioinformatics to the uses of data from collection specimens in biogeography, evolutionary biology, taxonomy, and conservation. A report such as the present one cannot do them justice, and it accordingly has to be seen as a mere sample of what was discussed.

Regarding the trade-offs involved in sequencing degraded DNA from old insect specimens, Trace Akankunda compared the traditional approach of amplifying only a small number of informative genes with a new nested PCR approach and concluded that the latter was promising. Sarah Mathews made

the case for including functional genes in bait sets for targeted enrichment, so that collection specimens can be used to study the evolution of such genes in rarely sampled taxa. Erinn Fagan-Jeffries pointed out that even neglected, unidentified, unsorted specimens from insect traps hold value for future researchers, as in her case when she extracted DNA from those unprocessed specimen soups for her research into parasitic wasps, discovering much higher species diversity than estimated previously. Kerensa McElroy walked her audience through the crucial steps in DNA library preparation from museum specimens, concluding that high quality oligonucleotides were important, but that a higher number of PCR cycles (such as might be helpful when starting material has a low concentration) did not bias her results as much as often feared.

Talks in the area of bioinformatics and phylogenetics, which are of course equally relevant to botany as to zoology, included Norman Warthmann's presentation on assembly- and alignment-free estimation of genetic distance. These approaches directly compare raw sequence reads from high-throughput shotgun sequencing of different samples, in the case of Warthmann's kWIP software using the pairwise vector product of kmer counts. He used the analogy of comparing "bags of words" representing jumbled-up texts without first going through the trouble of reconstructing the actual sentences.

Ian Brennan discussed the by now familiar choice between the three main phylogenetics approaches for genome-scale data: concatenation, inference of gene trees followed by inference of a species tree ("short-cut methods"), and a full multi-species coalescent analysis that estimates gene trees and species tree together. In his study group of snakes at least, he found that the different methods reconstructed different relationships between major clades but agreed on the existence of these major clades, and that most evolutionary inferences were robust to these differences.

A large number of talks focused on evolutionary and ecological applications of genomic data from collection specimens. Much of the morning of the second day was dedicated to sex determination and sex chromosome evolution in

vertebrates, with talks by Judith Mank, Jennifer Marshall Graves, Clare Holleley, and Meghan Castelli. Alexander Mikheyev presented a study of the famous Lord Howe Stick insect to demonstrate that museum specimens of that species are indeed conspecific with the little population that survived on Ball's Pyramid. A good example of the value of collections for making time series available for analysis was Angela McGaughran's study of the spread of resistance genes in a pest species, which examines to what degree resistance is the result of standing variation from before the introduction of the relevant pesticide. Other talks covered phylogenomics of Australian orchids (Katharina Nargar), population genetics of marsupials (Linette Umbrello), and the evolution of rock wallabies (Sally Potter), to name just a few.

Genetic data were, however, not the only kind that participants were using. Andrew Thornhill presented work that connected locality data from eucalypt specimens with soil and climate data, and two talks dealt with CT-scans producing three dimensional models of collection specimens. Marta Vidal-García discussed her work on the morphometrics of frogs, and Tom Semple his research on sex organs of Thynnine wasps. The 3D models of the wasps, for example, allow non-destructive assessment of the compatibility of the genitals of different (putative) species.

Although these talks represented only a small part of the whole, they make clear that there is another whole angle to unlocking currently under-utilised information from museum and herbarium specimens. Just as genomic data and sequencing of degraded DNA from old specimens have made possible many studies and analyses that would have been unthinkable twenty years ago, combining systematic specimen digitisation efforts with automated scoring of morphometric or colour data will open up new venues for research in taxonomy, ecology, and evolutionary biology in the future.

The talk slides for most presentations that were given at the conference are publicly available at the CBA website (Web ref. 2).

Web ref. 1. Conference website: <http://cba.anu.edu.au/news-events/genomics-and-collections-adaptation-macroevo>

<http://cba.anu.edu.au/news-events/genomics-and-collections-adaptation-macroevo/conference-program>

Web ref. 2. Conference program with talk slides:

Points of view

The time has come – or has it?

The suggestion that National History Collections (actually the body that holds the collection or the data needed by a researcher) should be listed within the authorship of research articles (Rouhan et al. 2017) might on the face of it seem quite reasonable. The value of herbarium data is increasingly being recognised in all sorts of research areas (e.g. Funk 2004 at Web ref. 1) and the inclusion of the institution in the list of authors rather than just in the acknowledgements, as is usual, might provide more visibility within the community and hopefully attract more funding for these traditionally underfunded bodies.

But is it practical? Comments provided on ASBS FaceBook, where Leon Perrie drew attention to the article, indicate that most people think it unlikely, but perhaps others disagree.

There are other areas where herbaria are poorly appreciated. It is pretty obvious that the massive use of the Austral[as]ian Virtual Herbarium has not translated into a modicum of the resources needed to maintain and extend the quality of its data.

References

Rouhan, G., Dorr, L.J., Gautier, L., Clerc, P., Muller, S. & Gaudeul, M., (2017). The time has come for Natural History Collections to claim co-authorship of research articles. *Taxon* 66(5): 1014-1016. DOI: <https://doi.org/10.12705/665.2>

Web ref. 1: <https://doi.org/10.12705/665.2>

Do words matter?

George Monbiot, columnist for the *Guardian*, indicates in an opinion piece (Web ref.) that “Language is crucial to how we perceive the natural world” and asks for “better ways of describing nature and out relationships with it so we can better defend it”. His examples of some of the words we use such as “no

take zones”, “ecosystem services”, “climate change”, “improved” pasture and “natural capital” and the implications they suggest will hopefully make you question them as well.

Web reference. <https://www.theguardian.com/commentisfree/2017/aug/09/forget-the-environment-new-words-lifes-wonders-language>

More accessible prose = more influence for publications

The Monbiot article above had already been written up when Karen Wilson on our FaceBook pages pointed to Doubleday & Connell’s (2017) proposition. As Karen says, the title of the paper is most unfortunate. It certainly doesn’t meet the goal of more accessible prose, the main objective of the argument presented in the paper, and consequently will probably not generate the attention it deserves.

The argument for simplifying scientific writing is an old one and the problem has been long recognised. At one time ABRS asked for a plain language summary of scientific work and they may well still do so. Many blogs are just this. When we give a talk we tailor it to the listening audience. Despite this when scientists get together they communicate in their own shorthand way just like any other group of professionals, whether it be via the written or the spoken word. And if we all suddenly become wonderful communicators what happens to those journalist/communicators who now translate our dense scientific work into more palatable forms for the general populace (see automated identification on p. 27).

Reference

Doubleday, Z.A. & Connell S.D. (2017). Publishing with Objective Charisma: Breaking Science’s Paradox. *Trends in Ecology & Evolution* 32(11): 803-805. <https://doi.org/10.1016/j.tree.2017.06.011> (not open access).

CARDS FOR SCIENTISTS FROM THEIR NON-SCIENTIST RELATIONS



Tom Gauld's cartoons

Now seems an appropriate time to point to Tom Gauld's cards for scientists from their non-scientist relations in the 12th August 2017 issue of *New Scientist* as mentioned by Jim Croft (ASBS Facebook, 16 Aug 2107). Tom kindly

gave us permission to re-publish this cartoon (Web ref.). His cartoons appear regularly in *New Scientist*.

Web reference. <https://twitter.com/tomgauld/status/897134785692401669>

Robyn Barker

Deaths

Joan Taylor (1929–2017)

Joan Taylor, an employee of the Australian National Botanic Gardens in Canberra from 1972 until 1992, passed away in October this year. During those years she worked as a research technician with Mike Crisp, amongst others, and Mike has undertaken to write about Joan's contribution to plant systematics for the next issue of the newsletter.

Peter Kloot

c. 1945–18 June 2015

This is a late acknowledgement of the death of a person who had influence in the botanical community of South Australia for some years but then left those circles for a different career within his Jewish community. For older South Australian botanists the name Peter Kloot is synonymous with weeds and Peter heavily influenced a number of the scientists at Biosecurity SA. In recognition of this, Peter was

awarded the CAWS (Council of Australasian Weed Societies) Medal for leadership at the 1987 Australasian Weeds Conference (Web ref. 1).

Peter came to Adelaide in the late 1960s to complete his degree in Agricultural Science and then joined the South Australian Department of Agriculture. Around 1971/2 he undertook a Master's Degree at the Waite Institute on pheasant's eye (*Adonis microcarpa* DC.) a garden escape which was becoming a serious crop weed. This work included the establishment of the correct name for the species introduced into Australia and involved taxonomic detective work in which he was advised by Dr Hansjoerg Eichler, and Professors C. Steinberg of Florence and H. Riedl of Vienna, with the work being supervised by David Symon. Later, while still employed by the Department of Agriculture in Adelaide but with his family removed to Melbourne for educational opportunities for

the children, he undertook studies for a Ph.D. even though travelling to Melbourne each weekend. This too was under the supervision of David Symon and the work on the alien flora of the agricultural areas of South Australia has provided a base line study for South Australian introductions ever since. It is the first port of call for anyone trying to establish when a particular plant species was first recorded for South Australia. Peter moved permanently to Melbourne in 1987 and began the second phase of his life becoming a prominent member of the Mizrahi community.

I'm not aware that Peter was ever a member of ASBS but talking to others confirms my recollections of him as an occasional attendee and/or speaker in those early years of the SA Chapter for which we lack records. His work certainly impinged on the South Australian flora work and he published a number of papers on naturalised plants in the *Journal of the Adelaide Botanic Gardens*. The work stemming from his Ph.D. thesis (Kloot 1986) is the first port of call for anyone trying to establish when a particular plant species was first recorded for South Australia.

The Jewish newsletter *Mizrachi Matters* volume 9 No. 39 was sponsored by Peter's wife, Shosh Kloot, and contains many tributes to him, including some from his children. Some of the information given above has been taken from there (Web ref. 2).

Web references

1. http://caws.org.au/caws_medal.php
2. www.mizrachi.com.au/sites/default/files/Newsletter2015-06-19Korach.pdf

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Plant collections

There are 120 plant collections attributed to Peter Kloot in the AVH, the majority of them from South Australia and in AD, but with a further 25 in MEL and 18 in CANB which are quite possibly duplicates.

Robyn Barker

Society for Conservation Biology
5th Oceania Congress

• 2-6 July 2018 •

Te Papa Tongarewa
Museum of New Zealand
Wellington, New Zealand

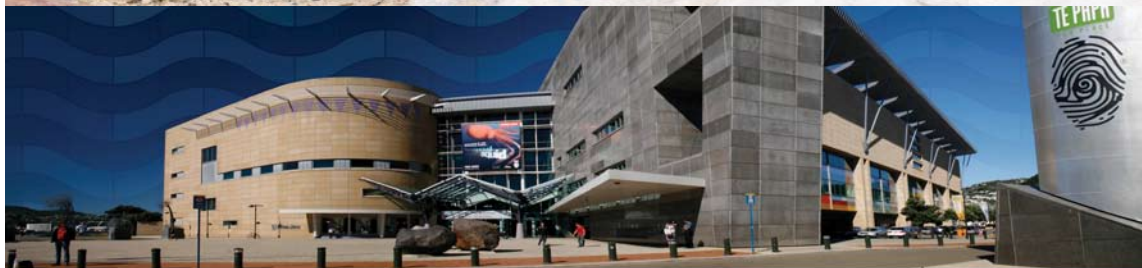
Conservation in a *changing* world



Society for Conservation
Biology Oceania



— CONSERVATION —
IN A CHANGING WORLD



New Zealand is a hotspot for biodiversity with great conservation initiatives from policy to practice.

Wellington is New Zealand's 'Natural Capital', with a focus on innovative urban conservation. The city is home to a number of significant threatened species, and is bringing the importance of nature into mainstream thinking.

The conference will be held at our modern national museum, Te Papa, embedded among national government head offices and NGO headquarters. Just 10 minutes from the CBD, ZEALANDIA is a must-see eco-attraction and ground-breaking restoration project. Wellington is also the heart of an ambitious urban pest predator-free programme, and the home of Otari-Wilton's Bush, the only botanic garden in New Zealand dedicated solely to native species.

Aside from our stimulating conference, Wellington offers easy access to nationally and internationally significant conservation projects and tourism opportunities within the city, the region and throughout New Zealand. Come to Wellington for SCBO and see New Zealand's world leading conservation in action.

Hosted by Victoria University of Wellington, Wellington City Council, Greater Wellington Regional Council, ZEALANDIA, Department of Conservation and the Wellington Chapter of SCB and the Society for Conservation Biology (Oceania).

wellington2018.scoceania.org



Coming conferences

Systematics 2017: Integrating Systematics for Conservation and Ecology

The joint Adelaide meeting of the Society of Australian Systematic Biologists, the Australasian Systematic Botany Society, incorporating the Invertebrate Biodiversity and Conservation Biennial Meeting is almost upon us, taking place on 26–29 November.

Details are located on the conference website

(Web ref. 1).

A draft programme was placed on the site on November 8th (Web ref. 2).

Web references

1. <https://systematics.ourplants.org/>
2. <https://systematics.ourplants.org/programme/>

Notices

Participation for cultural heritage significance assessment of the NSW National Herbarium collection

The National Herbarium of New South Wales (NSW), Royal Botanic Gardens and Domain Trust are undertaking a cultural heritage Significance Assessment of their Botanical Specimen Collection.

Context, a heritage consultancy, has been commissioned to carry out this Significance Assessment on behalf of NSW. The value and meaning of the collection is, in large part, related to the users of the collection, and to how and why the collection is used. Hence the importance of this survey and of your answers.

In 2016 you may have been invited to take part in a similar survey for the State Botanical Collection at the National Herbarium of Victoria (MEL). The current survey has a similar purpose and some of the questions may be the same, but it is otherwise completely unrelated and the focus here is entirely on the

NSW specimen collection.

We hope to receive responses from a wide range of people who use the collection in different ways. Please circulate this notice within your organisation and networks to encourage others to take part in this assessment. The survey is anonymous, will take between 5 and 10 minutes to complete, and will remain open until Friday 21 November.

Thank you in advance! We are extremely grateful for your assistance.

Survey site: <https://www.surveymonkey.com/r/HerbariumNSW>

Brett Summerell
Director, Science and Conservation
Botanic Gardens & Centennial Parklands
brett.summerell@rbgsyd.nsw.gov.au

Postal address change for Australian National Herbarium

Please note that the GPO Box for CANB has changed from '1600' to '1700'. We haven't moved but the several site GPO boxes have been amalgamated into one and the old ones have been disbanded.

Please send all mail and parcels to:

Brendan Lepschi
Curator
Australian National Herbarium (CANB)
Centre for Australian National Biodiversity
Research
CSIRO National Collections and Marine
Infrastructure
GPO Box 1700
Canberra ACT 2601
AUSTRALIA

Items of interest

Automated identification of herbarium specimens

An automated plant identification tool developed using the Convolution Neural Networks technology (Carranza-Rojas et al., 2017) was applied to 5 data sets, all of them as 256 by 256 pixel images. Two of the data sets were images of dried herbarium specimens from *iDigBio* for which they were able to achieve an impressive 80% or better correct identification. Application of the tool to fresh leaf scans of plants from France and Costa Rica however and to field images of plants from the French Mediterranean were less successful. The authors thought that the development of this new technique would add significantly to the “volume of descriptions of new species” in coming years.

Coincidentally three people pointed to three different interpretations of this paper on Facebook from their reading of reviews of it from different sources. The first reference by Adrienne McFroggy was to an article in *Nature* (Web ref. 1) in which it was assumed that automated identification is the future and “someday we’ll have students who won’t be able to remember when we didn’t have these sorts of tools”. The second reference by Jim Croft, was to a blog by the authors of the paper (Web ref. 2) where automatic specimen identification was advocated for unlocking the potential of the world’s herbaria, while the third reference by David Cantrill was to an item in *TechCrunch* (Web ref. 3) that indicated the discovery of new plant species in herbarium backlogs was another possible outcome.

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Web ref. 1. www.nature.com/news/artificial-intelligence-identifies-plant-species-for-science-1.22442

Web ref. 2. <http://blogs.biomedcentral.com/bmcseriesblog/2017/08/11/lets-leverage-herbaria-impact-through-deep-learning/>

Web ref. 3. <https://techcrunch.com/2017/08/11/deep-learning-could-discover-new-plant-species-hidden-in-centuries-of-herbarium-data/>

The mass extinction of scientists who study species

Craig McClain, Assistant Director of Science for the National Evolutionary Synthesis Center, has conducted deep-sea research for 13 years, participating in dozens of expeditions in the most remote regions of the Pacific and Atlantic oceans (Web ref.). This is his view on the decreasing number of taxonomists. [Karen Wilson, ASBS FaceBook].

Web reference. https://www.wired.com/2011/01/extinction-of-taxonomists/?mbid=social_fb_onsiteshare

What the ancestral flower looked like

Just as we were finalising the last issue of the newsletter news was appearing that we finally knew what the ancestor of all modern flowers looked like. The work was done by a team of people, predominantly in Europe (Sauquet et. al. 2017), the only Australian contribution being by Charles Foster of Sydney University. However lead author, Hervé Sauquet, has just moved to the National Herbarium of New South Wales in the Royal Botanic Gardens Sydney as a systematic botanist (Web ref. 1). The publication of the paper made it to the nightly news on 2 Aug 2017 (Web ref. 2: updated report). Despite the excitement engendered by the image of the ancestor it looks remarkably like the models of the primitive magnolia of our Botany I days.

References

Hervé Sauquet, Maria von Balthazar, Susana Magallón, James A. Doyle, Peter K. Endress, Emily J. Bailes, Erica Barroso de Moraes, Kester Bull-Hereñu, Laetitia Carrive, Marion Chartier, Guillaume Chomicki, Mario Coiro, Raphaël Cornette, Juliana H.L. El Ottra, Cyril Epicoco, Charles S.P. Foster, Florian Jabbour, Agathe Haeevermans, Thomas Haeevermans, Rebeca Hernández, Stefan A. Little, Stefan Löfstrand, Javier A. Luna, Julien Massoni, Sophie Nadot, Susanne Pamperl, Charlotte Prieu, Elisabeth Reyes,

Patrícia dos Santos, Kristel M. Schoonderwoerd, Susanne Sontag, Anaëlle Soulebeau, Yannick Staedler, Georg F. Tschan, Amy Wing-Sze Leung & Jürg Schönenberger. The ancestral flower of angiosperms and its early diversification. *Nature Communications*. DOI: 10.1038/ncomms16047. www.nature.com/articles/ncomms16047

Web ref. 1. <https://www.rbgsyd.nsw.gov.au/Science-Conservation/Science-Staff/Dr-Herve-Sauquet>

Web ref. 2. www.abc.net.au/news/2017-08-02/what-did-the-first-flower-ever-look-like/8762860

Mid Cretaceous fossil flowers – a second species

The genus *Tropidogyne*, described in 2010 from 100 million year old fossil flowers found in Burmese amber, has had a second species added (Poinar & Chambers 2017); the seven flowers on which the species is based are 3–5 mm diameter and were found in the same amber beds as the first species. Relationships are thought to be with *Ceratopetalum* (Cunoniaceae).

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Should Universities be wary?

Further to the item on the profitability of scientific publishing by companies such as Elsevier in the last issue of the Newsletter, an article on Elsevier becoming a data company (Web ref.) was drawn to my attention by Ainsley Calladine. Unfortunately it is not in an open access publication but those of you attached to universities may well be able to access it and read about concerns being expressed in some American quarters that Elsevier is well ahead of the game in creating products that scientists and administrators can use to record, share and store their data as well as measuring their scientific impact.

Web reference. Paul Basken (2017). Elsevier is becoming a data company – should universities be wary. *The Chronicle of Higher Education*. www.chronicle.com/article/Elsevier-Is-Becoming-a-Data/240876

And should you be wary of which journal you submit to?

Are you looking for a journal to which to submit your work? You should probably be aware of “predatory open access publishing”.

Web reference. Predatory open access publishing and the things that go on in the real world. https://en.wikipedia.org/wiki/Predatory_open_access_publishing

Seed dispersal by ants

Some interesting research from Charles Sturt University indicating that larger ants (*Iridomyrmex*) “tended to move more seeds to longer distances in disturbed zones” while smaller ants “carried out a greater percentage of short distance dispersals” in non-disturbed sites along roadsides. Using *Acacia pycnantha* seeds the authors also found that

the mean dispersal distance recorded in the disturbed zone (12.2 m) was almost double that recorded in the non-disturbed zone (5.4 m) for all roadside sites.

Dispersal distances recorded for Australian ants were considerably higher than a global mean of 1.99 m, while secondary seed dispersal (usually after the removal of the eliasome) was further in disturbed than in non-disturbed sites.

Reference

Zsófia Palfi, Peter G. Spooner and Wayne Robinson (2017). Seed Dispersal Distances by Ants Increase in Response to Anthropogenic Disturbances in Australian Roadside Environments. *Frontiers in Ecology and Evolution*. <https://doi.org/10.3389/fevo.2017.00132>

Journal of Ecology Special Feature

Volume 105, issue 6 of the British Ecological Society’s *Journal of Ecology* (November 2017) is a special issue featuring open access articles on the subject of long-term dynamics and impacts of plant invasions (Web ref.). The papers may well be of interest to some of you. However the one to take my eye was the Editor’s choice, a paper showing that host shifts for herbivorous insects can be manipulated by changing the ratio of two common plant volatiles (Li et al., 2017). This is of importance when biological control agents specific to particular weeds are introduced to new

countries. In this case the agent investigated was the flea beetle, *Agasicles hygrophila*, first introduced into Australia (and ?New Zealand) in the 1970s to control its host, alligator weed (*Alternanthera philoxeroides*). In China, where this study was carried out, it has already been observed that the flea beetle is also able to survive on *Alternanthera sessilis*, as well as *Portulaca oleracea* and the crop plants *Beta vulgaris* var. *saccharifera* (sugar beet) and var. *cicla* (chard).

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Web ref. <http://onlinelibrary.wiley.com/doi/10.1111/jec.2017.105.issue-6/issuetoc?campaign=woletoc>

Ventenat's names from the new flowers in the gardens of Cels and Empress Josephine

The authorship “Vent.” is a familiar one attached to Australian botanical names since we have 72 species described by him¹. This paper (Callmander et al. 2017) provides a comprehensive background to the French botanist Ventenat who published large, wonderfully illustrated books describing exotic plants from throughout the world between 1800 and 1808. His access to these plants was firstly through the garden of Jacques-Martin Cels (Ventenat 1800–1803; Ventenat 1803–1808) and then from the garden of Napoleon and Josephine at Malmaison (Ventenat 1803–1805).

There is an account of Ventenat's herbarium which eventually ended up in Geneva and a consideration of the other herbaria which he was able to study all leading to a section on lectotypifications and notes on 85 of the taxa he described. An Appendix provides a list of all of the 343 taxa he recognised as new. The authors “hope that botanists will be more cautious in lectotypifying Ventenat's names in the future and carefully take the historical context into consideration”. This is a plea which can be

¹ There are also two New Zealand species which bear his name.

made for many lectotypifications of the past but now there will be no excuse for those involving “Vent.” And there is no excuse for not knowing about the paper: it is already listed in APNI under the relevant taxa.

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Angiosperm phylogeny poster

Want your own colour copy of the latest Angiosperm phylogeny as a poster for teaching purposes or to hang in your office for consultation. Or you can have one on the phylogeny of Tracheophytes or one for Bryophytes as well. And if you don't want it in English, the posters are available in 17 other languages. These posters are freely available through Cole et al. (2017) or you can access them through the Angiosperm Phylogeny Website (Web ref. 1). The orders in the Angiosperm poster are hyperlinked to their entry on The Angiosperm Phylogeny website. The AP website also points to some further Botanical Charts available for teaching purposes at Web ref. 2.

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- Web ref. 1. www.mobot.org/MOBOT/research/APweb/
- Web ref. 2. www.cs.man.ac.uk/~david/flora/flora.html

Book reviews

A botanical cornucopia

Karen Wilson

National Herbarium of New South Wales, Royal Botanic Gardens and Domain Trust Sydney

This is a bumper year for publications by David Mabberley: two books published and one on the exquisite artistry of Ferdinand Bauer coming soon.

Mabberley's Plant-Book, Fourth Edition.

**By D.J. Mabberley(2017)
Cambridge University Press:
Cambridge.**

1102 pp. ISBN: 978-1-107-11502-6

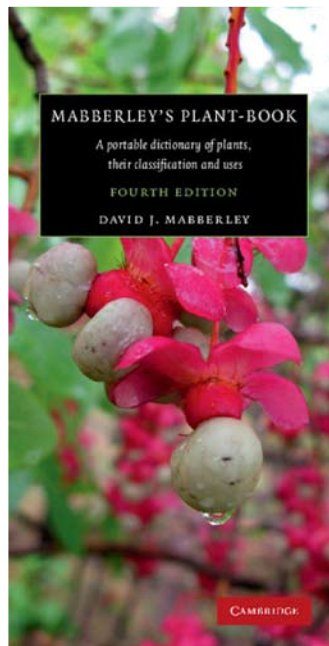
A new edition of *Mabberley's Plant-book* was launched at the International Botanical Congress in Shenzhen, China, in July. This is the fourth edition, continuing the tradition of a new edition each decade since the first edition in 1987 – a monument to the author's assiduity in keeping up with botanical literature and summarizing it in one volume.

The subtitle defines its subject nicely: 'A portable dictionary of plants, their classification and uses, utilizing Kubitzki's *The families and genera of vascular plants* (1990–) and current botanical literature; arranged according to the principles of molecular systematics'. As users of previous editions will know, 'dictionary' is rather a misnomer, it being more a mini-encyclopedia with its concise descriptions of families and genera: morphological features, numbers of genera and species, references to major revisions, and for each taxon its broad distribution, uses, vernacular names, and other features of interest such as secondary compounds and pollinators.

This is an invaluable and authoritative reference work to be kept close at hand and dipped into regularly for enlightenment and entertainment. On the latter score, I assume that the author has kept the 169 whimsical comments that

were in previous editions (see, for example, *Leucanthemum vulgare*) but I haven't yet looked for them all.

There are many updates in this edition, taking into account the advances in understanding of vascular plants and their relationships since publication of edition 3 in 2008. The book is still 'brick-like' as described by the author himself. It has 10% more pages but its thickness has slightly decreased thanks to using paper nearly as fine as cigarette papers (for those who remember roll-yer-owns). The font size is as small as before, so a magnifying glass may be handy for some. Rather unusually for these times, the book was printed in England.



There are 26,000 entries for family, genus and vernacular names, 1400 of them new, which is only slightly fewer than in the previous edition. The systematic arrangement of vascular plants is based on that used in the Kubitzki series but with changes in light of recent research, so that the system essentially follows APG IV (APG 2016) for flowering plants and Christenhusz et al. (2011) for ferns and lycophytes. As explained in the introduction, the author has been 'conservative in splitting families and genera', and he indicates where there is still debate about circumscription, e.g. in Santalales, Asparagales, Rubiaceae.

New in this edition are entries on commonly encountered orchid hybrid genera, as well as more of the economically important algae and bryophytes. There are also more vernacular names, particularly non-English names from modern literature. Two names that I consider classics of Aussie plant humour are not included: Lawyer Vine and Wait-a-while for

Calamus spp. The book ends with 30 new combinations and a new nothogenus, as well as several neotypes and lectotypes, proposed by the author and others to validate names used in the book.

The introduction explains the way in which the content was compiled but includes much more than that: comments on, for example, cultivated plants, large genera, botanical nomenclature, monophyly (recommended), all accompanied by references to useful primary literature. As before, the only figure in the book (pp. xii–xiii) illustrates the plant architectural models defined by Francis Hallé, each named after a botanist, ranging from Holttum and Corner to Troll and Bell.

The author pleads the ‘urgent need to complete an inventory of the plant species of the world before this becomes an exercise in palaeobotany’. He says that it is ‘perverse that, faced with this crucial task, cohorts of young trained botanists (and maturer ones) are, as ‘plant scientists’, actively deterred from this task, to concentrate on publication of papers of theoretical interest, in ‘high-impact’ journals, without which truly Neronian fiddling they cannot advance their careers. ...We can carry on with much of today’s more fashionable biology after ‘Rome burns’, but the basics of systematics could be just impossible in the future.’ One might argue that we need both kinds of research, and that they are not mutually exclusive, but all would agree that we need to accelerate knowledge of plants. Paving Paradise and putting up a parking lot (Mitchell 1970) is happening everywhere – and a tree museum is not far off.

In the meantime, do get yourself a copy of this



Fig. The author with Barbara Briggs and Gwen Harden at the book launch in the aptly named Florilegium bookshop in Sydney, 5 October 2017. Ph. K. Wilson

book and enjoy dipping into it.

References

- APG (2016) An update of the Angiosperm Phylogeny group classification for the orders and families of flowering plants: APG IV. *Botanical Journal Linnean Society* 181: 1–20.
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- Mitchell J (1970) Lyrics of a popular song *Big Yellow Taxi*. Online at <https://www.youtube.com/watch?v=xWwUJH70ubM>

Joseph Banks’ *Florilegium*.
By M. Gooding, D.J. Mabberley and
J. Studholme (2017)
Thames and Hudson: London.
320 pp. ISBN 978-0-500-51936-3

This is an impressive volume in both size (cut-down A3) and content – a combination of pictorial splendour and authoritative, interesting text.

The story of Joseph Banks and his travels with Cook on the *Endeavour* voyage around the world (1768–1771) has been told many times – ditto the slow progress of Banks’ *Florilegium* – for example in Carr (1983). In this new book,

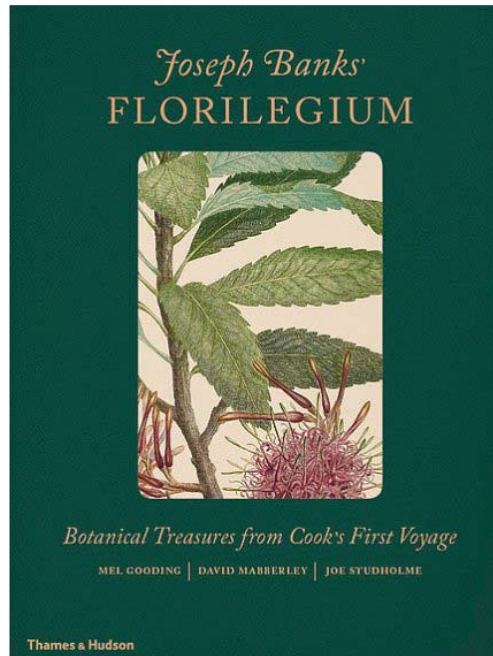
art historian Mel Gooding outlines the history of the expedition and the working methods of Banks and his group, followed by the production back in London of the full-colour paintings and then engravings for the *Florilegium*, and ending with an account of the chequered history before production of the sumptuous full set (Alecto Historical Editions 1980–1990). Joe Studholme of Editions Alecto gives an interesting account of the painstaking work involved in producing that hand-coloured, full-scale set of 743 prints of *Banks' Florilegium* – a massive production in all senses, produced 200 years after the expedition.

On the *Endeavour* expedition, Banks' entourage included Herman Spöring (his secretary), Daniel Solander (naturalist and a favourite pupil of Carl Linnaeus), Sydney Parkinson (artist) and Alexander Buchan (artist). The artistic work was to be divided between Parkinson (to execute natural history drawings) and Buchan (portraits, figure scenes and landscapes). Unfortunately, Buchan died in April 1769 in Tahiti, leaving Parkinson to produce nearly all artistic studies apart from some drawings of people and topography by Spöring. The full range produced by the three artists can be appreciated from the various watercolours and sketches in Gooding's chapters and also in the earlier biography of Parkinson (Carr 1983), which beautifully complements this new work.

And what an output it was: in 28 months Parkinson produced about 276 finished and 676 unfinished drawings of plants, 83 finished and 212 unfinished drawings of animals, and about 100 drawings of people, scenery and boats. His last work was done during the expedition's three month stay in Java, where he contracted the dysentery that killed him (as well as Spöring and others) shortly after the expedition set

sail from Batavia. The unfinished drawings resulted from the pressure of keeping up with all the new organisms found by the expedition (they collected about 30,000 plant specimens, representing over 3600 species). Parkinson generally did a pencil sketch of the subject with salient features painted in watercolour and notes about the colours used. If he had not died, he would presumably have finished these drawings on the long voyage home from Java to England.

In the event, back in London Banks hired several artists – Frederick Polydore Nodder, James and John Frederick Miller, Thomas Burgis and John Cleveley Jr – to prepare full watercolour paintings from 595 of Parkinson's unfinished sketches of plants, supplemented by examination of the dried plant specimens. These paintings and sketches are all in the Natural History Museum in London, which displays most of them on its *Cook*



Voyages website (Web ref.).

Banks then employed 18 engravers to convert many of these watercolours to copper plates for publication as a *Florilegium*. Plants were Banks' main interest, and there does not seem to have been any thought of a similar project for the zoological drawings from the voyage. The plants were depicted at approximately life-size apart from one, so the plates were big (c. 18" X 12") to accommodate large objects such as *Banksia* cones. This resulted in a few little plants sitting incongruously isolated in the middle of an otherwise blank plate, e.g. *Caltha appendiculata* (Pl. 16 in this new book), but most subjects fill most of the plate.

Banks abandoned the project in 1784 (various reasons have been advanced for this) and the 743 engraved plates ended up wrapped and

stored in the Museum. A few were reproduced over the next century, but it was two centuries before the full set of coloured plates was published by the Natural History Museum and Alecto Historical Editions (1980–1990). This was a lavish and expensive production, limited to 100 sets, making it accessible only to a limited number of people. A few of those sets went to subscribers in Australasia, including some State libraries. One private subscriber generously bequeathed his set to the Royal Botanic Gardens Sydney.

This new book makes a selection of 147 of these plates available for the first time to a wide audience. They were selected as being amongst the best of the engravings, with an emphasis on economically and ecologically important subjects. They are organised chronologically by the regions visited by the expedition:

Madeira: plates 1–3

Brazil: pls 4–11

Tierra del Fuego: pls 12–19

French Polynesia ('Society Islands'):
pls 20–38

New Zealand: pls 39–76

Australia: pls 77–140

Java: pls 141–147.

David Mabberley provides a commentary on each plate: on the species pictured, its geographical occurrence, site of collection by Banks and Solander, morphology, vernacular name, family, uses, etc. The text for *Ipomoea aquatica* (Plate 145), for example, starts 'Banks and Solander may have encountered this plant on the dining table and in markets as well as in the wild'. Current botanical names are used but Solander's manuscript names are mentioned, too, demonstrating how many names were not published by Banks and Solander.

A concordance at the end of the book links each plate to its number in the full Alecto edition of the *Florilegium* and in the catalogue of Judith Diment et al. (1984, 1987), as well as giving the names of the watercolourist and engraver.

The plates were photographed from the Alecto edition engravings and are reproduced at about $\frac{3}{4}$ of their original size. To my eye, this results in often more pleasing illustrations since the colours are intensified by the coloured lines of the engravings being closer together. The

colours in both works are often not quite true to life or as depicted in the watercolours by Parkinson and the later artists in London because of the limited range of colours used for the Alecto edition (commonly 10–17 colours per plate). The difference in colours can be seen by comparing a finished plate with its matching watercolour, e.g. *Thespesia populnea* in Plate 23 and on p. 299 of this book. However, this does not detract from the overall beauty of the plates, and one marvels at the skill of the engravers shown in their fine lines, including magnifications of small floral parts in some plates.

In summary, the authors are to be congratulated on producing a magnificent sampler of the lavish work initiated by Sir Joseph Banks and finished two centuries later.

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- Diment, JA, Press JR, Shaughnessy E, and Newington L (1987) Catalogue of the natural history drawings commissioned by Joseph Banks on the *Endeavour* voyage 1768–1771 held in the British Museum (Natural History). Part 2: Botany: Brazil, Java, Madeira, New Zealand, Society Islands and Tierra del Fuego. *Bulletin British Museum (Natural History) Historical Series* 12: 1–200.
- Web ref. www.nhm.ac.uk/our-science/departments-and-staff/library-and-archives/collections/cook-voyages-collection/endeavour-botanical-illustrations/about3.dsm1

Postscript: David Mabberley on Ockham's Razor

David spoke about the *Florilegium* on the ABC's Ockham's Razor on 28 October. The podcast will be available for listening or reading online for some months.

Web ref. www.abc.net.au/radionational/programs/ockhamsrazor/a-botanic-record-250-years-in-the-making/9091680

New books

This is an eclectic list of books come across from various sources. The source of the information provided about the book often comes from the publisher's blurb and where this is the case, is acknowledged. Where reviews have been found these are pointed to. Members who wish to draw attention to books in the same way are welcome to do so. Note that the listing of books here does not preclude their being reviewed in the Book Review section.

Drosera of the World

**By Allen Lowrie, Richard Nunn,
Alastair Robinson, Greg Bourke,
Stewart McPherson & Andreas
Fleischmann**

**Redfern Natural History Productions,
2017.**

ISBN: 978-1-908787-16-3

**Hardback with dust jacket; 536pp; 606
images; 270 x 205 mm.**

www.redfernnaturalhistory.com/product/drosera-of-oceania/

[www.youtube.com/](http://www.youtube.com/watch?v=QJOvMktM7Ak)

**[watch?v=QJOvMktM7Ak](http://www.youtube.com/watch?v=QJOvMktM7Ak) (promotional
video)**

Price: \$90 AU (e.g. Andrew Isles)

This is the first volume of a series of three books that document all carnivorous sundews (*Drosera*) of the world, for the very first time and in unparalleled detail.

Droseras are amongst the most recognised carnivorous plants worldwide for their distinctive, dew-covered insect-trapping leaves, with flowers that range from simple and diminutive to some of the most spectacular of all carnivorous plants. The genus is widespread, occurring across Eurasia, Africa, North America, South America and Oceania, where the highest levels of diversity worldwide are found on the Australian mainland, which is home to over 150 species and more than half of the species in the genus. These remarkable plants inhabit a broad range of ecological niches, from the wet bogs of the boreal north to sub-Antarctic alpine meadows and even seasonally-wet desert landscapes. The first species of *Drosera* were described more than 500 years ago, but new species continue to be discovered even today. These generously illustrated volumes document all *Drosera* species recognised to date, featuring in-depth

descriptions, background information and over 1900 photographs, as well as an exhaustive index of all *Drosera* names and synonyms.

The first volume covers Oceania, the second Oceania, Asia, Europe, North America and the third Latin America and Africa and all three are now available.

Biogeography and Evolution in New Zealand

By Michael Heads

**CRC Biogeography Series, CRC Press
of Taylor & Francis Group,
Boca Raton, Florida; 2017**

**Hardback: ISBN: 978-1-4987-5187-2
(RRP A\$ 165.99)**

**eBook: ISBN: 978-1-4987-5188-9 (US\$
179.95 on CRC site; A\$ 120.90)**

**[www.crcnetbase.com/isbn/978-1-4987-
5187-2](http://www.crcnetbase.com/isbn/978-1-4987-5187-2)**

The table of contents of this book can be seen in the freely downloadable "Front matter" on the website given above. A review of the book by John Grehan appeared in the *Botanical Society of Otago Newsletter* 80: 13–14 (Feb 2017) and this has been reproduced on the Taxacom pages (Web ref.) for those who don't have access to the Newsletter.

Web reference. [http://mailman.nhm.ku.edu/
pipermail/taxacom/2017-February/130901.html](http://mailman.nhm.ku.edu/pipermail/taxacom/2017-February/130901.html)

Australian Vegetation

**By David A. Keith (ed.), Third edition
Cambridge University Press; 2017**

**ISBN 978-1-107-11843-0 (hardback);
766 pp.**

**RRP \$110.95 AU (hardback); \$97.90
AU ebook**

**[www.cambridge.org/au/academic/sub-
jects/life-sciences/plant-science/austra-
lian-vegetation-3rd-edition?format=HB
&isbn=9781107118430](http://www.cambridge.org/au/academic/subjects/life-sciences/plant-science/australian-vegetation-3rd-edition?format=HB&isbn=9781107118430)**

Australian Vegetation has been an essential reference for students and researchers in botany, ecology and natural resource management for over 35 years. Now fully updated and with a new team of authors, the third edition presents the latest insights on the patterns and processes that shaped the vegetation of Australia. The first part of the book provides a synthesis of ecological processes that influence vegetation traits throughout the continent, using a new classification of

vegetation. New chapters examine the influences of climate, soils, fire regimes, herbivores and aboriginal people on vegetation, in addition to completely revised chapters on evolutionary biogeography, quaternary vegetation history and alien plants. The book's second half presents detailed ecological portraits for each major vegetation type and offers data-rich perspectives and comparative analysis presented in tables, graphs, maps and colour illustrations. This authoritative book will inspire readers to learn and explore first-hand the vegetation of Australia. [Publisher's website].

There is a limited preview on-line (Web ref.) which also has a short review. Thanks to Bob Parsons for bring this to my attention.

Web reference. <https://www.amazon.com/Australian-Vegetation-David-Keith/dp/1107118433>

...of men and orchids... Part 1.

By Rudolf Jenny

Published by the author, Allmendingen, Switzerland. 2015.

ISBN: 9942212329. 303 pp.

Limited edition (250 copies).

Price: c. £132.50

<https://www.nhbs.com/of-men-and-orchids-part-1-book>

Apparently part one of a projected 4-volume study. Although not overflowing with information about the author this is a very well-illustrated book on the history of orchid collecting and naming and contains some fascinating information about people involved in the orchid world, many of them not so familiar to Australian eyes. Part 2 (ISBN-13: 9789942283122) was published in Jan 2016.

Native Orchids of Kangaroo Island: a field guide.

By Kangaroo Island Flora & Fauna Club Inc., Orchid Group. 2017

ISBN 978 0-646 97282 4; soft cover; ring-bound; 154 pp.

**Copies available from Kangaroo Island Flora & Fauna Club, C/- PO. Box 613, Kingscote, SA 5223 or email: SecretaryKIF&F@gmail.com
Price: AU\$25-00 plus P & P, \$9-00**

Text in this book is by Bev Overton, with photos, except where indicated, by her husband Dean. The Overtons were awarded a well-deserved Lifetime NRM Achievement Award in 2016 (Web ref.) and this book is just one of

many activities they have been involved with in their over 35 years caring for the native vegetation on the island. There are apparently 81 to 89 orchids recorded for Kangaroo Island but the Orchid Group has only been able to find and record 68, despite many years of searching. This probably say more about the state of orchid taxonomy than their abilities to find them! Each of the 68 species has information on the flowering time, habitat and soil type and its rarity or otherwise together with brief, comparable descriptions of the parts of the leaf, scape and flower. Also associated with each of the species are at least four or five photos of the plants. A handy field guide for those visiting the island, a trip which it is worth making.

Web reference. www.naturalresources.sa.gov.au/kangarooisland/get-involved/KI-Local-Achievers-NRM-Awards-2017

The mistletoes of subtropical Queensland, New South Wales and Victoria.

By John T. Moss and Ross Kendall.

Runcorn

Butterfly and other Invertebrates Club, 2016.

Octavo, paperback, 134 pp., colour photographs, line drawings and maps. AU\$35.00

A comprehensive reference book and a field guide to all 46 species of mistletoe known to occur in subtropical Queensland, New South Wales and Victoria. It provides a detailed introduction to mistletoes, their biology and current information on the roles they play in various ecosystems. Each species is illustrated by colour photographs supported by detailed plant descriptions, information on habitat and host plants. It also provides details of the 24 butterfly and three moth species that use various mistletoes as hosts. This book will be a key reference for landowners, people working in the vegetation management industry, and people interested in the natural world.

Aboriginal placenames: naming and re-naming the Australian landscape
Ed. by Harold Koch and Luise Hercus
Aboriginal History Monographs 19.

ANU E Press; 2009

eISBN: 978-1-921666-09-4

<http://press.anu.edu.au/publications/aboriginal-history-monographs/aboriginal-placenames>

This was an item which was first noticed on the JSTOR list of Open Access publications, but it has been freely available through ANU Press since its publication in 2009.

Aboriginal approaches to the naming of places across Australia differ radically from the official introduced Anglo-Australian system. However, many of these earlier names have been incorporated into contemporary nomenclature, with considerable reinterpretations of their function and form. Recently, state jurisdictions have encouraged the adoption of a greater number of Indigenous names, sometimes alongside the accepted Anglo-Australian terms, around Sydney Harbour, for example. In some cases, the use of an introduced name, such as Gove, has been contested by local Indigenous people. The 19 studies brought together in this book present an overview of current issues involving Indigenous place-names across the whole of Australia, drawing on the disciplines of geography, linguistics, history, and anthropology. They include meticulous studies of historical records, and perspectives stemming from contemporary Indigenous communities. The book includes a wealth of documentary information on some 400 specific place-names, including those of Sydney Harbour, the Blue Mountains, Canberra, western Victoria, the Lake Eyre district, the Victoria River District, and southwestern Cape York Peninsula. [Publisher's website]

Ten Thousand Years of Cultivation at Kuk Swamp in the Highlands of Papua New Guinea

Edited by Jack Golson, Tim Denham, Philip Hughes, Pamela Swadling & John Muke

Terra Australis 46; ANU Press; 2017
ISBN: 9781760461157 (paperback), 9781760461164 (ebook)
<http://press.anu.edu.au/node/2540/download>

Rhys Gardner of AK drew attention to this recently published book.

This body of work represents 50 years of research that has established Kuk Swamp [the original Kuk Agricultural Research Station in the Western Highlands of Papua New Guinea] as the 'type site' for the investigation of early agriculture in New Guinea, and New Guinea as

a globally significant centre of early agriculture and plant domestication. Furthermore, the global, national and local significance of Kuk has been recognised through its successful nomination to the United Nations Educational, Scientific and Cultural Organization (UNESCO) list of World Heritage Sites [Web ref.] in 2008. [Adapted from the Prologue, p. xx].

Web reference. www.worldheritagesite.org/list/Kuk

German ethnography in Australia
Edited by Nicolas Peterson & Anna Kenny

ANU Press; September 2017
ISBN (print): 9781760461317; ISBN (online): 9781760461324
<https://press.anu.edu.au/node/2618/download>

This volume comprises papers from a conference titled *The German Anthropological Tradition in Australia* at the Australian National University, 18-19 June 2015. While much of the conference was to do with the work of the Strehlows', one of its other aims was to "bring together scholars to explore the significance of German-language ethnography in Australia" and the resulting papers of this latter part of the program are available here for downloading. Many of the names associated with this work are familiar to Australian botanists as are their plant collections; we have for example the missionaries associated with Hermannsburg such as the Strehlows, Kempe and Schultze, as well as a thorough account of the life of Herbert Basedow by David Kaus. Erckenbrecht's history of the German Moravian missionaries on Cape York Peninsula at Mapoon, Weipa and Aurukun may not reveal any plant collections but the missions were presumably used as a base by those who did and many of the papers have excellent maps of the area concerned which could be useful in interpretation of localities of collections.

Margaret Flockton: a fragrant memory

By Louise Wilson

Wakefield Press, Adelaide. 2016
ISBN: 9781743054475 (HB); 320 pp.
AU\$49.95
www.wakefieldpress.com.au/product.php?productid=1320

Unlike most of the rest of the population, the name Margaret Flockton is fairly well

known amongst botanists. Some of this may be because of the Margaret Flockton award (Web ref. 1) for scientific botanical illustration offered by the Royal Botanic Gardens, Sydney (see p. 11). Others will know her name because she was the illustrator for Joseph Maiden's *Forest Flora of New South Wales*, for *A critical Revision of the Genus Eucalyptus*, and for a series of colour illustrations of prickly pear species to accompany Maiden's accounts in the *Agricultural Gazette of New South Wales* from 1898 to 1914. So popular has been this book, written by a great, great niece of Margaret Flockton or Auntie Mog as she was known, that it is presently out of stock. A reprint is in train and you can register on the website to be let know when it is available again. The author's own web page (Web ref. 2) provides links to reviews and blogs, the most comprehensive of the latter being by Lisa Hill (Web ref. 3).

Web references

1. <https://www.rbgsyd.nsw.gov.au/Science-Conservation/Botanical-Illustration/Margaret-Flockton>
2. www.louisewilson.com.au/margaret_flockton.html
3. <https://anzlitlovers.com/2017/02/05/margaret-flockton-a-fragrant-memory-by-louise-wilson/>

Sol amazing: lycophytes & ferns of the Solomon Islands.

By Cheng-wei Chen, Leon Perrie, David Glenny & Wen-Liang Chiou
National Museum of Natural Science, Taiwan. July 2017
ISBN: 978-986-05-2972-2
578 pp.; Chinese and English

A beautiful new book titled "Sol AMAZING Lycophytes & Ferns of the Solomon Islands" has just been published. Congratulations to all of the authors: David Glenny based here at CHR, Leon Perrie at Te Papa, Cheng-Wei Chen and Wen-Liang Chiou both at the Taiwan Forestry Research Institute. [The Allan Herbarium (CHR) Facebook page]

The book is the second resulting from Taiwan's first biodiversity-based foreign aid program and is a result of cooperation between the National Museum of Natural Science and the Dr Cecilia Koo Botanic Conservation Centre in Taiwan and the Solomon Islands Ministry of Forestry and Research. There have been 34 expeditions over 5 years and 370 species, some of them new, are documented here. Colour

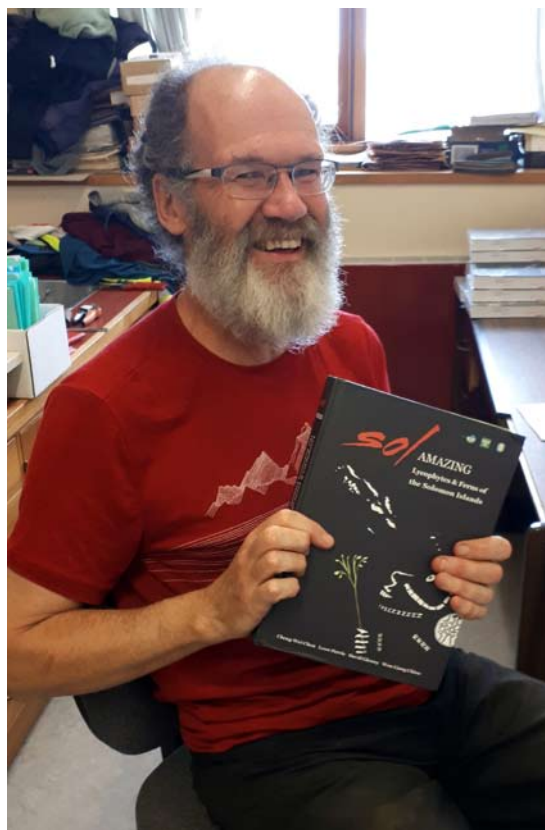


Fig. David Glenny, one of the authors of the new Solomon Islands fern publication. Ph. J. Prebble

photographs abound and each species has a habit photograph, usually accompanied by a number of close-up photographs of diagnostic characters.

Downloadable as a free pdf from two sites (Web refs.), the first being much slower than the second.

Web references

- https://www.researchgate.net/publication/320109996_Sol_Amazing_Lycophytes_ferns_of_the_Solomon_Islands
- <https://drive.google.com/open?id=0B5RUBsaIstbaeko0S0t4cF15WEU>

Field guide to the plants of Solomon Islands

Edited by Wen-Liang Chiou, Jer-Ming Hu, Chih-Hui Chen, Chien-Fan Chen, Hsiu-Chun Huang, T. Y. Aleck Yang (eds)
National Museum of Natural Science, Taichung, Taiwan. 2016
ISBN: 9789860490381
334 pp.; English & Chinese

This is the first book resulting from the cooperative research referred to above. This does not appear to be available as a downloadable and there is no mention of either publication in the English section of the National Museum of Natural Science website and only the second book, above, is referred to on the website of the overarching body, Taiwan ICDF. There was however a press release (Web ref.).

Web reference. <http://taiwantoday.tw/news.php?unit=2,23,45&post=102362>

Robert Fortune – a plant hunter in the Orient

By Alistair Watt

Kew Publishing, Royal Botanic

Gardens, Kew, 2017. ISBN:

9781842466193; hard cover, 410 pp.

RRP: UK £45.00 (Kew Shop); US \$70

(University of Chicago Press); AU \$95

(Florilegium). Also available through

other book supply agencies for around

AU\$65.

<http://shop.kew.org/robert-fortune-a-plant-hunter-in-the-orient>

The first full biography of the great Scottish plant collector Robert Fortune, famous for working in China and Japan from 1843 until 1861. This detailed presentation of his life includes an extensive analysis of his travels, botanical and zoological collections and plant introductions, including the first detailed maps of his collecting itineraries in China.” [from web page above].

Reviews can be found in *GardenDrum* (Web ref. 1) and *The Sydney Morning Herald* (Web ref. 2). This book was mentioned by Karen Wilson on the ASBS FaceBook page.

Web references

1. <https://gardendrum.com/2017/08/10/review-robert-fortune-plant-hunter-orient/>
2. www.smh.com.au/lifestyle/home/book-celebrates-robert-fortune-the-plant-hunter-who-forever-changed-our-gardens-20170428-gvugll.html

International Review of Environmental History

<https://press.anu.edu.au/publications/international-review-environmental-history>

Having been lured to the ANU Press site I noticed this relatively new open access journal,

first published in 2015 and edited by James Beattie, Victoria University of Wellington. While individual articles can be downloaded for free, printed issues of this now biannual journal are available for \$30.

International Review of Environmental History takes an interdisciplinary and global approach to environmental history. It encourages scholars to think big and to tackle the challenges of writing environmental histories across different methodologies, nations, and time-scales. The journal embraces interdisciplinary, comparative and transnational methods, while still recognising the importance of locality in understanding these global processes.

The journal's goal is to be read across disciplines, not just within history. It publishes on all thematic and geographic topics of environmental history, but especially encourage articles with perspectives focused on or developed from the southern hemisphere and the 'global south'. [From the website]

So far there is probably a preponderance of New Zealand papers but amongst those to take my eye were:

- The curious case of the marginalisation or distortion of Russian and Soviet environmental history in global environmental histories by David Moon (vol. 3, issue 2);
- Regarding New Zealand's environment: The anxieties of Thomas Potts, c. 1868–88 by Paul Star (vol. 3, issue 1);
- Cultivating the cultural memory of *Ranunculus paucifolius* T. Kirk, a South Island subalpine buttercup by Joanna Cobley (vol. 3, issue 1);
- Political agitation for forest conservation: Victoria, 1860–1960 by Stephen Legg (vol. 2);
- New perspectives on methodology in garden history: Approaches towards writing about imported medicinal plants in colonial New Zealand by Joanna Bishop (vol. 2);
- Environmental disturbance triggering infestations of gorse, rabbits, and thistles in Southern New Zealand: 1850 to 1980 by Peter Holland and Guil Figgins (vol. 1).

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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

Membership is open to all those interested in plant systematics. Members are entitled to attend general and chapter meetings, and to receive the Newsletter. Any person may apply for membership by filling in a "Membership Application" form, available on the Society website (www.asbs.org.au), and forwarding it, with the appropriate subscription, to the Treasurer. Subscriptions become due on 1 January each year.

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Edited by Helen Hewson, 1987

This Newsletter issue includes the reports from the February 1986 Boden Conference on the "Systematic Status of Large Flowering Plant Genera". The reports cover: the genus concept; the role of cladistics in generic delimitation; geographic range and the genus concepts; the value of chemical characters, pollination syndromes, and breeding systems as generic determinants; and generic concepts in the Asteraceae, Chenopodiaceae, Epacridaceae, *Cassia*, *Acacia* and *Eucalyptus*.

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Evolution of the Flora and Fauna of Arid Australia (book)

Edited by W.R. Barker & P.J.M. Greenslade.

Peacock Publications, ASBS & ANZAAS, 1982

This collection of more than 40 papers will interest all people concerned with Australia's dry inland, or the evolutionary history of its flora and fauna. It is of value to those studying both arid lands and evolution in general. Six sections cover: ecological and historical background; ecological and reproductive adaptations in plants; vertebrate animals; invertebrate animals; individual plant groups; and concluding remarks.

Cost: \$20, plus \$10 postage (in Australia).

This book is almost out of print. There are a few remaining copies.

To order a copy of this book email Bill Barker at: bill.barker@sa.gov.au

History of Systematic Botany in Australasia (book)

Edited by P.S. Short. A4, case bound, 326 pp. ASBS, 1990

No longer available

Australasian Systematic Botany Society Newsletter

The Newsletter keeps ASBS members informed of Society events and news, and provides a vehicle for debate and discussion. In addition, original articles, notes and letters (not exceeding ten published pages in length) will be considered.

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