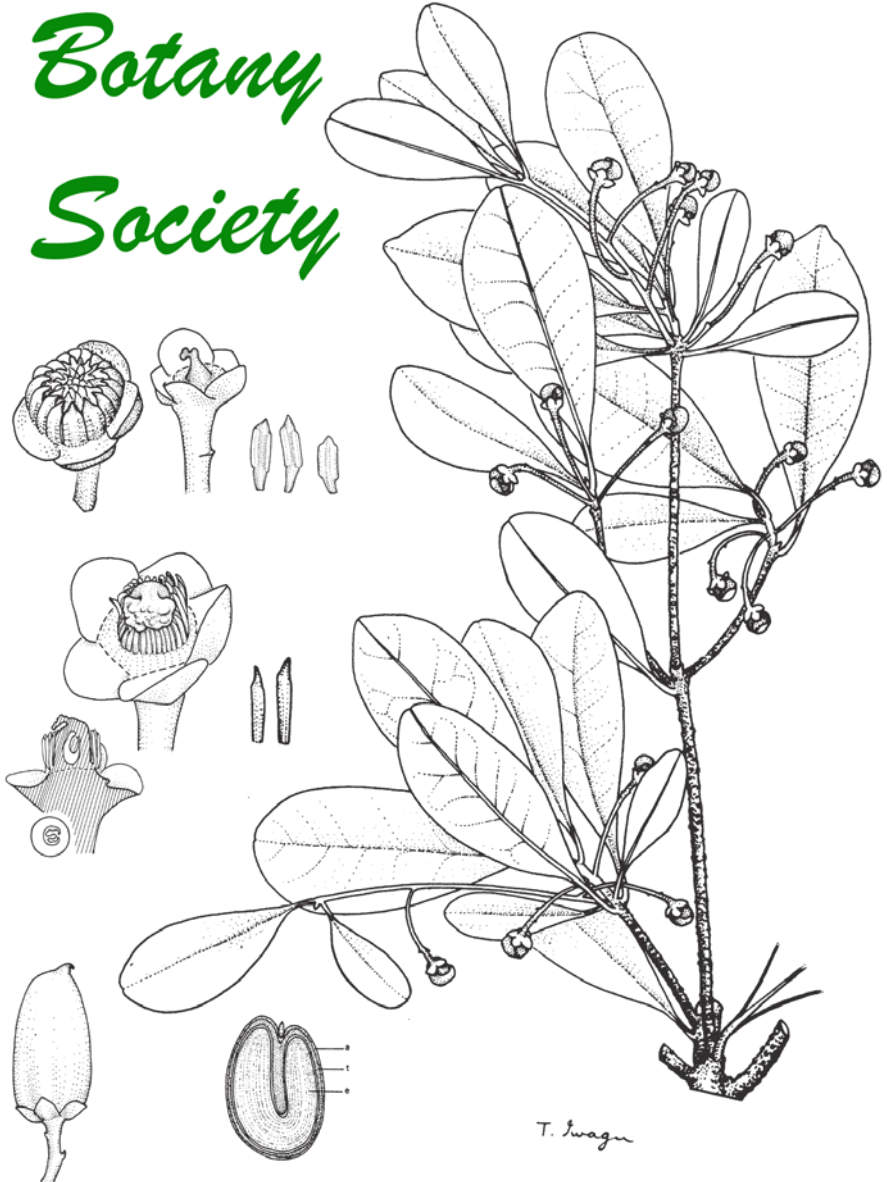


ASBS

*Australasian
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Botany
Society*



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ASBS Facebook Group

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

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Hansjörg Eichler Research Committee

Philip Garnock-Jones
David Glenny
Greg Leach
Sarah Matthews
Christopher Quinn
Chair: Mike Bayly, Vice President

Grant application closing dates

Hansjörg Eichler Research Fund:
on March 14th and September 14th each year.
Australian Conservation Taxonomy Award:
on 22nd May 2015, 2016

Cover image: *Ternstroemia monostigma* W.R.Barker (Pentaphragmaceae), a New Guinea endemic. Male and female flowers and parts (minus petals), fruit, seed in section. *Artist* Taikika Iwagu. *With permission of* the National Herbarium of Papua New Guinea.

Inclusion in envelope with this issue

Nomination forms for ASBS Council 2015–16 (due 2nd October) –
CSIRO Publishing *Plants* brochure – Chinnock Opuntioidei Cacti book order form

Publication dates of previous issue

Australas. Syst. Bot. Soc. Newslett. 161 (December 2014)
ASBS Web site: 23rd Feb 2015. Printed version: 27th Feb 2015
On-line Addendum to issue 161 on ASBS Web site: 20th Feb 2015

From the President

Budget cuts in New South Wales

The Sydney press has highlighted major cuts to the 2015–16 operating budget of the Botanic Gardens and Domain Trust amounting to \$1.5 million and 16 staff, additional to larger staff cuts in previous years (Web ref. 1). The science programs are earmarked on this occasion, though no specific announcement has been made on the effect on the Herbarium and its staff. To this time the Herbarium has had to trim its expenses but not suffered significant staff losses.

The projected cuts belie the advertising in 2014 of major redevelopment of the Gardens and Domain under the banner “The World’s best and Sydney’s own” that embraced a high profile for science. Any loss of a staff so productive in publications advancing scientific knowledge of Australian plants hardly reflects such an accolade.

In keeping with its state and capital being the oldest and most populated in the Australian Commonwealth, the New South Wales National Herbarium can rightly claim to be one of the most productive centres of research in plant systematics in Australia and in the world, a claim applicable for at least the past 50 years. Australia can ill afford the threat to such an institution which will further undermine the ability to deliver valuable and timely science about the still inadequately known Australian flora.

Web ref. <http://www.smh.com.au/nsw/sixteen-staff-lost-in-nsw-budget-cuts-to-botanic-gardens-funding-20150626-ghyjyd.html>

Two Standing Committees make use of skills and experience of our membership

Our Society is rich in expertise and experience both in the practice and administration of plant systematics and in other matters that impinge on societies such as ours. Councils have their own overall ranges of expertise and experience, and this may vary from time to time. Some critical functions may benefit from a concentration of focus and expertise and a continuity in membership. Rather than relying on *ad hoc* approaches to varied individual members and non-members for advice, Council benefits from such focused groups for critical functions.

Our Research Committee has been the prime example of such a standing group. Many have participated in it, some, as mentioned below, for many years ensuring a degree of consistency in decision making. The Chapter Conveners and their circle of members form another set of long-standing groups and our Newsletter’s editorial team another. Our Public Officers should also be mentioned in performing a single essential non-elected function continued over many years.

Under Society business below two new Standing Committees have been announced.

The first will support our Treasurer in advising Council on our approach to investment of our substantial finances. The second will recommend to Council a framework and scope of grants and grantees for furthering research and other aspects of plant systematics.

Respective chairs, Treasurer John Clarkson (Financial Advisory) and Vice-President Mike Bayly (Grants Policy), are thanked for setting up these advisory groups, which were chosen by Council. We particularly thank all those approached for so readily accepting what will be an important role in the Society.

For further details see p. 3.

Burbidge Medallist 2015

It is with great pleasure that I can announce on behalf of Council this year’s Burbidge Medallist Professor Jack Elix. Jack has global recognition for his innovative work in chemotaxonomy of lichens and his active collaboration in the recognition of many new species and genera. Jack is unable to give a Burbidge Lecture at the Canberra conference, but with the help of the lichen world a ceremony commensurate with the prestige of this award is being planned.

Plaudits for Chris Quinn

Having recently farewelled Betsy Jackes from the Hansjörg Eichler Research Committee, we now express our gratitude to a similarly long-serving member of the panel in Chris Quinn. Chris has been singular in his unfailing response to the persistent six-monthly call to assess about half a dozen applications. Thank you, Chris, you deserve to have some respite from your invaluable service to the Society.

ASBS 2015 Canberra

Canberra has a deserved reputation for great conferences and Council members are hearing a lot of interest in attending, including from over the Tasman. The organisation committees are well advanced in planning the programme. Keep your eye on the conference website for registration details for what promises to be a rich programme, workshops and field trip. (See p. 6).

Nominations for Council due

My term as President is up. I am not intending to stand for any other position on Council. While current intentions are that other members of Council will stand for re-election, Council does encourage any financial members interested in taking up a role on Council to nominate.

I suggest contacting members of present or past Councils (listed on the ASBS web site) or me to learn of their experiences if you are so inclined.

Response to call for grants

There were a good number of applications for the recent round of Hansjörg Eichler Research Grants and the Australian Conservation Taxonomy Award. Congratulations to those who were successful.

The Society is especially appreciative of The Nature Conservancy and James Fitzsimons for their offering two awards this year, in the light of the strong field of applicants and there being no award last year.

As has happened once previously, an applicant was successful in both awards. Council supports this so long as two distinct projects are applied for.

Calling for a new Newsletter editorial team

The current editorial team is hoping to be able to step down this year. Each of us would like to spend more time on our other pursuits. Council would like to hear expressions of interest in joining a new editorial team. A team seems a good way to deal with the raft of editorial requirements. The current editors have had interests in different jobs that most enthuse them, making the commitment less onerous for each. If it helps, perhaps those considering a role might divorce printing and distribution of the hard copy from consideration as this can potentially be dealt with efficiently in Adelaide, at least in the first instance.

Membership fees

Our Treasurer reports a high degree of success in calling in outstanding membership fees. Thanks to all who have paid up. Despite our small society having significant expenses, we do charge a low annual fee. The more members are fully paid up the greater the opportunity to expand our higher earning accounts, particularly our special purpose research funds. So let's keep those payments rolling in!

Bill Barker

Australasian Systematic Botany Society Inc.

Nominations for membership of the 2015–16 Council

In accordance with Section 13 of the Society's Rules, nominations are hereby called for membership of Council. Council consists of the following positions: *President, Vice-President, Secretary, Treasurer and two (2) Councillors.*

Nominations must be received by the Secretary, Leon Perrie at Museum of New Zealand Te Papa Tongarewa, PO Box 467, Wellington 6011, New Zealand (leonp@tepapa.govt.nz) before 5 pm Friday 2nd October.

Nomination forms can be obtained from the Secretary (leonp@tepapa.govt.nz) or from the ASBS web site at www.asbs.org.au/council/2015-16_Council_Nominations_Web.pdf

Notes

- A member may be nominated simultaneously for any number of positions on Council but is ineligible to hold more than one position at one time.
- Interested members are encouraged to nominate for a position on Council.
- The President is standing down and not standing for re-election.
- While under the Society's Rules there are limits to the number of consecutive years for each Council position, all other incumbent Councillors are eligible for re-election.

ASBS Inc. business

Two advisory groups appointed by Council

Council has recently appointed two Standing Committees to advise it.

Both bodies are made up of people with appropriate experience and have been deliberately kept relatively small.

Taking into account discussions by members at the past two Annual General Meetings, Council has specified the proviso that funds to be made available for research and any other member activities in systematics should only erode interest accruing and that accumulated principal of such funds should maintain or improve in value, allowing for inflation. This is important to considerations of both committees.

Financial Advisory Standing Committee

- Patrick Brownsey, Te Papa Museum, Wellington
- David Cantrill, Royal Botanic Gardens and National Herbarium, Melbourne
- Bob Hill, Dean of Science, University of Adelaide
- Ad hoc adviser to the Committee:
Bruce Evans, Botanic Gardens of Adelaide
- Convener/Chair: John Clarkson, Treasurer

This group will review our approach to investments in our general and special funds. By our Constitution, only members can make up these committees. Bruce Evans has kindly agreed to be available as a *pro bono* adviser to this committee, as he is to a number of societies.

Grants Policy Standing Committee

- Darren Crayn (ATH)

- Alexander Schmidt-Lebuhn (CANB)
- Jen Tate (MPN)
- Peter Weston (NSW)
- Peter Wilson (NSW)
- Convener/Chair: Mike Bayly, Vice President

This committee will advise on our approach to dispersing our grant funds that support research projects and potentially other *ad hoc* pursuits in plant taxonomy and systematics. In the first instance Council needs them to advise on the best use of the considerable financial legacy that Marlies Eichler left us.

We thank these members for making this special commitment to support the Society.

Bill Barker

First round of 2015 Research Grants

Hansjörg Eichler Research Fund, March 2015 round

This round we had five applications. Grants were awarded to the following three students.

- Tim Collins, University of New England: Rare and endangered *Eucalyptus magnificata* L.A.S. Johnson and K.D. Hill (Myrtaceae): genetic diversity and taxonomy. \$1,500.
- James Clugston, RBG Sydney and University of Edinburgh: Identification of *Cycas* species in Australia using leaf cuticle micromorphology. \$2,000.
- Catherine Clowes, The University of Melbourne: *Spyridium parvifolium* (Rhamnaceae): an investigation into the

Australasian Systematic Botany Society Inc.

Notice of 2015 Annual General Meeting

In accordance with Section 25 of the Society's Rules, notice is hereby given that the annual general meeting of the Australasian Systematic Botany Society Inc. will be held on Monday 30th November in the Discovery Lecture Theatre on CSIRO's Black Mountain Site, Canberra, beginning at 4:45 pm (AEDT).

The purpose of this meeting is to:

- confirm the minutes of the annual general meeting held on 26th November 2014 (see ASBS Newsletter 161: 3–17).
- receive reports from Council on activities of the Society during the preceding financial year,
- declare the results of the vote for membership of Council.

species phylogeny, morphology, genetic diversity, phylogeography and ecology.
\$2,000

Unsuccessful applicants were provided with feedback on their applications and we have encouraged them to resubmit in future rounds.

**Australian Conservation Taxonomy Award,
May 2015 round**

We had seven applicants for the Botany category of this years ACT Award. This is a great response following the low response last year. This seems to vindicate our decision to delay the closing date for applications allowing for the long lead times in scoping projects for postgraduate degrees at the higher levels.

We are grateful to The Nature Conservancy and James Fitzsimons for offering to make two awards available for botany this year.

Those granted awards are:

- James Clugston, RBG Sydney: *Exploring new approaches for conservation genetics of Cycas calcicola Maconochie (Cycadaceae) in Australia*
- Rachael Fowler, University of Melbourne. *The genus Eremophila in Australia's arid zone: phylogeny and biogeography in South Australia*

The Research Committee singled out Charles Foster's application for a special commendation.

The Zoology awardee, chosen from six applicants, was Kirilee Chaplin from The University of Melbourne and Museum Victoria with the project *Taxonomy, ecology and*

conservation genetics of grassland earless dragons (Agamidae: Tympanocryptis spp.) in north-eastern Australia. The Society for Australian Systematics Biologists committee gave a special commendation to Damien Esquerré from The Australian National Univeristy.

Thanks

As usual, the efforts of the ASBS Research Committee in assessing these grant applications is greatly appreciated. The committee members in this grant round were Sarah Matthews, Chris Quinn, Phil Garnock-Jones, Greg Leach and David Glenny. James Fitzsimons was again welcomed in joining in the selection process for the ACT Award.

Sarah Matthews is the newest addition to the Research Committee and this was her first round of grant assessments. Welcome to the team Sarah!

After twelve years (!) on the committee Chris Quinn has decided to step down and the latest round of Australian Conservation Taxonomy awards is to be his last. We extend our deep thanks to Chris for his outstanding service to the committee and the society over such a long period of time. We will be on the hunt for at least one new committee member before the next grant round!

The next round of applications for Eichler grants will close on September 14th 2015.

Mike Bayly
Ex officio Chair, Research Committee

Australasian Systematic Botany Society Inc.

2015 Membership Fees

These are due on January 1st each year.

You should have received an email from the Treasurer regarding current fees and any back fees.

Subscription rates:

Ordinary/Institutional members \$45 (AUS)

Full-time students / retired / unemployed \$25 (AUS)

This is also an opportunity to donate to the Research Fund.

Prospective Members need to download a membership form from the membership section of the ASBS web site.

Please direct enquiries to John Clarkson, our Treasurer.

Current affairs

From a white paper in Australasian plant systematics and taxonomy to a decadal plan – an update

Katharina Schulte
Project co-ordinator, Decadal Plan Initiative
James Cook University, Cairns

Since the last White paper forum and workshop held at the ASBS conference in New Zealand, the White paper project group built on the ideas and issues raised by the ASBS members, and made progress towards conceptualising a document that aims to provide a well-argued, rigorous and persuasive case, with supporting documentation, for continued and increased funding and other support for plant taxonomy and systematics in Australia and New Zealand.

From an all-rounder to a document with a clear focus and target group

One of the most frequently asked questions regarding the White paper project has been “who are we writing for, who is our audience?” - which indeed is a key question. Initially, the idea was to produce an all purpose document for multiple audiences, i.e. government agencies at state and federal level, a diverse range of stakeholders, the general public and our own community. Through further discussions about the scope and aim of such a document it became clear that the White Paper approach might not be effective, in particular because of the difficulty to produce a document that was appealing and relevant enough to a highly diverse audience. Further it was discussed that a White paper format may not be the best strategy to get our messages through to particular audiences. In a prioritisation process, it was established that one of our most important audiences are the state and federal government agencies as major funding sources of our discipline, as well as the general public and other stakeholders. At this stage, it was agreed that a White paper would be most suitable to address government agencies at the different jurisdictional levels, whereas the general public and many of our stakeholders may be best addressed through an increased engagement with the media. For the latter, the development of a media strategy was seen as highly desirable to raise the public

profile of our discipline, a process that could potentially be co-ordinated by the ASBS with the input and support of its members.

From a White paper to a Decadal plan in Australasian Biodiversity Science

In the next step, the White paper group looked into how other science disciplines communicate their issues to government, and found that a White paper format may not have the impact initially anticipated. While these documents usually provide an excellent summary of the state-of-the-art and the unresolved issues in a particular discipline, the main concern was that recommendations are often too general and without clear targets, and therefore may not be followed up upon to the required extent. An alternative approach is a Decadal Plan, which have been developed by different Australian science communities, such as Astronomy, the Space Sciences or the Ecosystem Sciences – some of them with remarkable success. Decadal Plans go beyond the content of a White Paper by providing a clearly outlined roadmap for the next decade coupled with an indication of the required funding for the implementation of the plan. Therefore, the White paper group agreed that we should aim for writing a Decadal Plan in Australasian Biodiversity Science (current working title).

In the meanwhile, Kevin Thiele consulted with Mark Westoby, who is the chair of the AAS committee Ecology, Evolution and Conservation regarding the prospects of a Decadal Plan for our discipline. The Australian Academy of Sciences (AAS) has coordinated Decadal Plans in a number of disciplines in the past. According to Mark Westoby, a recent review of the previous Decadal Plan initiatives by the AAS indicated that while success in terms of increased funding may not be guaranteed, the development of a plan was a highly recommended process for the respective

scientific community because they were able to achieve more than they would have otherwise. Mark also expressed his support for such an initiative.

From a plant systematics perspective to a broader, all biota comprising, perspective

Because this initiative originated in the plant systematics community, it has been a recurrent question whether to represent the botanical community only or to include the zoological community as well. Arguments for the first option were mainly that this could be achieved more quickly and maybe more easily - but with an undesirably smaller expected outcome. Because issues in the botanical and zoological systematics communities are very similar, it was agreed that it would be highly desirable to develop a Decadal Plan including all biota. Certainly this will bring some challenges in planning and co-ordination. Nevertheless, we are convinced that it will be highly beneficial for both systematics communities to jointly make a persuasive case for increased support for Australasian biodiversity science. As a first step in this direction, the Head of the Council

of Heads of Australian Faunal Collections (CHAFC), Mark Norman, was contacted and invited to join the monthly teleconferences of the Decadal Plan group.

Work on the Decadal Plan to date and outlook

So far, the Decadal Plan group has reached a consensus about what the Decadal Plan should more or less look like in format and style, inspired by the Astronomy Decadal Plans. A first outline has been drafted and work on the first chapters, which mainly deal with the questions who we are, why our discipline is important, and what we have achieved so far, has commenced.

Developing an actual plan for the next decade is at the stage of first discussions. The Decadal Plan Initiative is aiming to hold respective symposia at the upcoming conferences of the ASBS conference in Canberra (29th November – 3rd December 2015) and SASB conference in Fremantle (6th – 9th December 2015). We are looking forward to a productive and inspiring discussion about the future of Australasian systematics and taxonomy with you.

Coming meetings

ASBS Conference, Canberra 2015

We intend to have three set sessions that we hope will be of broad interest to ASBS members and capitalise on the expertise of the scientific community in Canberra.

One session will be about the use of biological collections in research. This topic is not only important to us but also very timely due to the recent creation of the National Research Collections Australia, a program within CSIRO that brings together in one structure all the biological collections, associated research scientists, and the Atlas of Living Australia (ALA).

The second will be on the use of genomic data in systematics, partly inspired by the participation of the Centre for Biodiversity Analysis (CBA), but also by the evident interest in this topic at last year's Palmerston North conference. The CBA is a joint venture between CSIRO and the Australian National University with the aim of uniting biodiversity science, genomics and

novel analysis methods.

Modern, integrated and interactive floras will be the topic of the third set session of the conference.

Other sessions will highlight the work of ASBS members covering topics that are not captured in the set sessions. Their focus and size will depend entirely on the abstracts submitted. The abstract submission form will ask you to provide a category that your talk belongs to. This is intended to facilitate grouping presentations into sessions, but as always contributions on any topic of relevance to plant systematics are encouraged.

On Thursday and Friday (3–4 December) we are planning to have two workshops. The first will be on coalescent theory, using multi-locus data in phylogenetics and species tree analysis. We are hoping to get an international speaker for this workshop who is actively involved in the development of this methodology. The second



workshop is currently planned as being on the use of ALA tools in our research, especially on exploring and visualising phylogenetic, character and geographic information with

the PhyloLINK application.

Alexander Schmidt-Lebuhr
for ASBS2015 Canberra Organising Committees

Conference web site: www.asbs.org.au/cbr2015

From the Editors

Allocation of International Standard Serial Numbers (ISSN) to the *ASBS Newsletter*

The publication of a major correction to a book review in issue 160 of the *ASBS Newsletter* as an on-line addendum to issue 161 prompted enquiries to the Australian ISSN Agency at the National Library of Australia.

The response confirmed that the addendum had the same ISSN as the Newsletter series with which it was associated, but revealed that:

- the printed and on-line versions of each issue formed effectively two different

Table 1: International Standard Serial Numbers (ISSNs) for the two titles of the *ASBS Newsletter* in their printed and on-line versions. The “X” suffix, requested to aid recognition, is not a requisite of online ISSNs.

Title	Medium	Published issues	Year of publ'n	Potential issues	ISSN applied	Correct ISSN
<i>Australian Systematic Botany Society Newsletter</i>	Printed	1–143	1974–2010	No more	1034-1218	1034-1218
<i>Australian Systematic Botany Society Newsletter</i>	On-line pdf	109–144/5	2001–2010	1–108	1034-1218	2205-054X
<i>Australasian Systematic Botany Society Newsletter</i>	Printed	144/5–161	2010–	Current ongoing series	1034-1218	1839-7522
<i>Australasian Systematic Botany Society Newsletter</i>	On-line pdf	146–161	2011–	Current ongoing series	1034-1218	2204-910X
<i>On-line Addendum to Australasian Systematic Botany Society Newsletter</i>	On-line pdf	161	2011–	Available into future	1034-1218	2204-910X

serials requiring their own unique ISSN, and

- the original ISSN of the *Australian Systematic Botany Society Newsletter* had to be changed with the title change to the *Australasian Systematic Botany Society Newsletter*.

On 2nd November 2011 ISSNs were allocated to conform with both these requirements (Web refs 1–3). Till now these have never been applied. Furthermore, the title on the Newsletter front cover was changed in different issues.

We have been advised to assign ISSNs to our Newsletter, as summarised in Table 1. This does allow for alternatives for retrospective application. We have a choice of amending the ISSN on the title page of each scanned pdf, or, preferable at least in the first instance, to provide an over-arching statement for each title in each publishing medium in the Newsletter page(s) on the ASBS web site.

We have also now been allocated a new ISSN for the current array of scans of the *Australian Systematic Botany Society Newsletter* and any future pdfs made available on the Web (Web ref. 4).

Acknowledgment

Staff of the Australian ISSN Agency are thanked for their clear and detailed responses.

Web references

Current National Library of Australia on-line references to our serial under its two titles

1. *Australasian Systematic Botany Society Newsletter* [printed]. http://trove.nla.gov.au/work/158431160?q=1839-7522&c=article&sort=holdings+desc&_id=1432516388510&versionId=172682922
2. *Australasian Systematic Botany Society Newsletter* [on-line]. http://trove.nla.gov.au/work/158431160?q=issn%3A%2218397522%22&c=article&sort=holdings+desc&_id=1432516480130&versionId=211125977
3. *Australian Systematic Botany Society Newsletter* [printed]. http://trove.nla.gov.au/work/18990030?q=issn%3A%2210341218%22&c=article&sort=holdings+desc&_id=1432023758686&versionId=46279711
4. *Australian Systematic Botany Society Newsletter* [on-line]. http://trove.nla.gov.au/work/18990030?q=issn%3A%222205-054X%22&c=article&l-availability=y&sort=holdings+desc&_id=1432514562005&versionId=211808967

Bill Barker

Articles

Homonymy of genera

Stephen McLoughlin

Department of Palaeobiology, Swedish Museum of Natural History, Stockholm

Philip Short recently faced the problem of having established a plant genus that turned out to be a homonym of an earlier-named genus. In 2014, he erected the name *Roebuckia* for a range of daisy species in his review of *Brachyscome*. However, *Roebuckia* had already been established as a name for a fossil (Early Cretaceous) plant from Western Australia by myself (McLoughlin, 1996). Because homonyms are illegitimate according to the International Code of Nomenclature for Algae, Fungi and Plants (McNeill *et al.*, 2012), Philip was obliged to establish a new name (*Roebuckiella*) for those species he had previously assigned to *Roebuckia* (see Short, 2015).

Such cases are not uncommon, and

international plant nomenclature committees are regularly called upon to make decisions on whether a younger homonym or synonym should be conserved or not when it may have been used much more extensively and frequently than its older valid homonym or synonym. Some of these issues date back to the earliest days of modern plant systematics.

How, then, can one be sure that when establishing a new genus, the chosen name has not been used before? The simple answer is that there is no single comprehensive database that one can turn to that enables one to find whether an existing name has been used previously. The problem is exacerbated by the fact that, although the naming of extant plants, fossil plants, fungi and algae are governed by

the same Code, the names of genera within these groups are commonly compiled in separate published databases. There have been various attempts, past and ongoing, to compile comprehensive lists of taxon names for these major groups, and in some cases to provide a unified list of names for all groups. These have met with varying levels of success depending on funding and the degree of effort directed towards the project.

Because plant systematists are most likely to face the problem of homonymy between extant and fossil plants, I compiled a short list of some of the key databases that one can search to assess prior usage of a genus name. Given the problem that arose with *Roebuckia* outlined above, I briefly tested these databases to see how well they fared in highlighting several generic names for plant fossils that I had erected over the past 25 years in journals of varying prominence and accessibility.

A brief survey of names indices

Index of generic names of fossil plants ... (IGNFP) is a series of publications published by Andrews (1970), Blazer (1975), Watt (1982) and Schultze-Motel (2003). They are arguably the most comprehensive resources for checking the names and typification of fossil plant genera. The first three of these are available as pdfs from the US Geological Survey (Web refs. 1–3). The last is available online via Google Books (Web ref. 4). These compendia obviously do not catch any fossil genus published after 2000.

Fossilium Catalogus Plantae is a print series of at least 113 volumes as of 2014 published by Backhuys (Leiden, The Netherlands). Each volume provides data on the names of genera within a particular plant group (the alphabetical catalogue of angiosperm genera is not yet complete – currently up to the letter R). The cut-off date for some plant groups is back in the 1980s. The last update of cycads, for example, appears to be that of Dijkstra & van Amerom (1982). Moreover, the majority of this database is apparently not available online.

The ***International Plant Names Index (IPNI)***; Web ref. 5) is very useful for checking the names of extant plants, but is not so useful for listing the names of fossils.

The ***Fossilworks*** site (Web ref. 6) contains the

names of over 300 000 taxa (fossil animals and plants) but it is far from comprehensive.

The ***Global Names Index (GNI)*** (Web ref. 7) contains many examples of names spelled in slightly different ways. A query beginning with one string of characters will find data associated with any of the variations in the spelling of a name.

The ***GBIF*** database (Web ref. 8) provides a single point of online access to more than 500 million biological records shared by hundreds of institutions globally. It claims to be the largest biodiversity database on the internet, with data relating to more than 1.5 million species. This database picks up the names of many fossil genera, but not all. It is especially deficient in picking up names of taxa published in smaller regional journals and in journals of mixed content (e.g., many geological journals).

The ***Index Nominum Genericorum (ING)*** (Web ref. 9) allows online searches for the names of genera of both extant and fossil plants, together with fungi and algae but the list is far from complete.

Additionally, there are a range of databases that deal with particular groups of organisms, and dispersed parts of organisms (e.g., fossil spores, pollen and dinoflagellate cysts). Some useful examples include:

Algaebase (Web ref. 10) provides data on over 130 000 species of marine, freshwater and terrestrial algae.

Rob Fensome and Graham Williams have a relatively up to date (2013) database (***DINOFLAJ2***) (Web ref. 11) of fossil and extant dinoflagellates at generic, specific and infraspecific ranks.

New names of fossil and extant fungi (and fungi-like groups, such as Peronosporomycetes) should be registered with ***MycoBank*** (Web ref. 12), which links to the associated ***Index Fungorum*** (Web ref. 13). These databases have search functions for tracking down over 100 000 fungi names.

From the mid-1950s to mid-1980s, the ***Catalog of Fossil Spores and Pollen*** was issued in loose-leaf volumes and on card stock, and provided standardized descriptions and illustrations of palynomorph taxa. Traverse *et al.* (1970) provided a history and status of the

Table 1. A comparison of the coverage of generic names in several databases and with the results of using the Google search engine using several generic names established by the author. [Continued on p. 11]

Article details		
Genus, author and date	Journal	Available online
<i>Roebuckia</i> McLoughlin, 1996	<i>Records of the Western Australian Museum</i>	Yes, but only recently through the WA Museum and ResearchGate
<i>Medwellia</i> Nagalingum & McLoughlin (in McLoughlin et al., 2002)	<i>Memoirs of the Australasian Association of Palaeontologists</i>	Yes, but only since 2011 via personal copy on Academia.edu and ResearchGate
<i>Rintoulia</i> McLoughlin & Nagalingum (in McLoughlin et al., 2002)	<i>Memoirs of the Australasian Association of Palaeontologists</i>	Yes, but only since 2011 via personal copy on Academia.edu and ResearchGate
<i>Gladiopomum</i> Adendorff, McLoughlin & Bamford, 2002	<i>Palaeontologia africana</i>	Yes, but only since 2011 via personal copy on Academia.edu and ResearchGate
<i>Rebezamites</i> Pott, McLoughlin, Lindström, Wu & Friis 2012	<i>International Journal of Plant Sciences</i>	Yes, via the journal
<i>Nogoa</i> McLoughlin 2012	<i>Alcheringa</i>	Yes, via Taylor and Francis

project at that time. The *Genera file of fossil spores and pollen* by Jansonius & Hills (1976 to 1990) was published as a Special Publication of the Department of Geology, University of Calgary, and consisted of 4811 filing cards. I am not aware of any online access to these palynomorph catalogues.

Beyond all of these databases, there is the simple Google search. Google is remarkably powerful in detecting taxon names, even if many of the links it provides do not tell much about the taxon. To simply know that a taxon name already exists can be useful in itself.

Testing the indices

To my knowledge no single database encompasses all generic names covered by the Code. So let us see how some of the major online databases fared in detecting the names of a selection of genera that I have established, as set out in Table 1.

The take-home message from the tabulated results is that one cannot trust the major online systematic databases to be complete at this stage. A Google search is apparently as effective at detecting names of recently published fossil genera as any of the major databases. Finally, there is no substitute for knowing one's field and good investigative research to track down that name, holotype or illustrated specimen.

For the future

In the long-run, however, it would be immensely useful for those entering systematic research

to have access to a single comprehensive database of all taxon names (including animals, bacteria and other micro-organisms) and their author details. For fossils, the International Organisation of Palaeobotany should seriously investigate directing some resources towards integrating the names of fossil plants into the existing large databases of extant plants to help avoid issues such as that encountered with *Roebuckia*.

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[Table. 1. extended]

Did the database recognize the genus?						
IPNI	ING	GNI	IGNFP	GBIF	Fossilworks	Google search
No	No	No	Yes	No	No	Yes
No	No	Yes	No	Yes, but no authors	Yes, no taxon authors; but gives full reference to paper	Yes
No	No	Yes	No	Yes, but gives incorrect authors	Yes, no taxon authors; but gives full reference to paper	Yes
No	No	No	No	No	No	Yes
No	Yes, but gives an invalid authority	No	Yes, but gives an invalid authority	No	No	Yes
No	No	No	No	No	No	Yes, but low in the search list

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- <http://pubs.usgs.gov/bul/1517/report.pdf>
- http://books.google.se/books?id=Zih8b6st49MC&printsec=frontcover&source=gbs_ge_summary_r&cad=0#v=onepage&q&f=false
- <http://www.ipni.org>
- <http://fossilworks.org/bridge.pl>
- http://gni.globalnames.org/name_strings
- <http://www.gbif.org/species>
- <http://botany.si.edu/ing/>
- <http://www.algaebase.org/search/genus/>
- http://dinoflaj.smu.ca/wiki/Main_Page
- <http://www.mycobank.org/>
- <http://www.indexfungorum.org/>

Editorial note

At the last minute we have discovered The International Fossil Plant Names Index (<http://fossilplants.info>), a developing Russian web facility which might eventually address these issues in relation to fossil names. None of Stephen's test names are as yet included in it.

We are grateful to Bob Hill for contacting Stephen when we requested an article from the palaeontological field to cover this subject and to Stephen for providing the article.

Eds

What happened to Ernest J Bickford F.L.S. and his collections?

Greg Keighery

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This note started when attempting to reconstruct the flora of the Western Suburbs of Perth we (Keighery and Keighery, 2015) came across an unused, largely forgotten epithet in *Samolus*, *S. bickfordiana* W.V. Fitz.¹, named in honour of the afore-mentioned Ernest J. Bickford. In attempting to locate a type collection for the name as part of continuing taxonomic work on *Samolus*, I discovered that there are two collections attributed to Bickford in Australian Herbaria: *Isotropis juncea* from New Norcia in 1897 (MEL, PERTH) and *Daviesia croniniana* from the same year but surely not from New Norcia as its closest current record is at distant Merredin (MEL). I strongly doubt that Bickford collected either of these specimens as he mainly collected around Perth, but it is recorded that Bickford did receive poison plant collections to identify (e.g. *Anthocercis littorea*, Web ref. 1).

Why was a species named after Bickford who seems not to have collected anything of note? Bickford came to Western Australia from Victoria in 1894 to manage a furniture store. He was obviously well acquainted with Mueller, who nominated him as a Fellow of the Linnaean Society, possibly in 1895, for his study and lectures on orchids in Victoria, to which he was subsequently elected on 5th January 1897. Then I discovered that Bickford was the inaugural president of the Mueller Botanic Society in Western Australia and instrumental in its founding in 1897. Bickford served as President of the Society from 1897 to 1902, then as a councillor before the cessation of the Society in 1903, when it merged with and became the Western Australian Natural History Society (enabling both geology and zoology to be part of the Societies studies). He was elected a councillor of the newly amalgamated Society (Web ref. 2). Bickford was a confidant of the Premier of the Colony and subsequent State, Lord John Forrest, and a J.P. Bickford served as a Perth City Councillor (1898-1901) and was convener of the General Purposes/Parks

and Gardens Committee which laid out Perth Gardens, especially Perth Park, now Queens Gardens and Hyde Park. He was also President of the Western Australian Chamber of Manufacturers (Web ref. 3) and a Justice of the Peace.

He wrote several major articles on Wildflowers:

- The Vegetation of Western Australia. *Western Australian Yearbook 1896/97*, pp. 279-305.
- History of Plant Life (published in *Journ. Proc. Mueller Botanic Society W. Aust.* vol. 1, pp 1-8 (Sept 1899, Web ref. 4) (also in the *West Australian Saturday* 5th Aug 1899, page 11 and *Western Mail* 8th Sep 1899, p. 26).
- The Sleep of Plants (lecture on 27th Feb 1900, Web ref. 5) *West Australian* Friday 25th May 1900, page 2)
- The Protection of the Wild Flowers of Western Australia (lecture on 24th July 1900, discussion published in *Journ. Proc. Mueller Botanic Society W. Aust.* vol. 1, p. 7 (1900)
- Wildflowers of Western Australia (Web ref. 6) in *Journ. Proc. Mueller Botanic Society W. Aust.* vol. 1 (4): 3-19 (1899). The second part of this series was given at the Society on 23rd Oct 1900 but never published. This talk was illustrated by paintings by Margaret (Lady) Forrest, Lucy Creeth, Miss E. Outram and Noel Doyle Kidson.

Reporting on the inaugural annual general meeting of the Society in 1898 (Web ref. 7), the *West Australian* noted that 11 field excursions were held in 1897 and

specimens collected by members have laid the foundation of a valuable herbarium, ... The Society has for its objects the formation of an herbarium of Western Australian plants; a botanical library... and the exchange of specimens and seeds. ... Miss Jessie L. Hussey of Port Elliot, South Australia and Miss Cons of Bunbury have presented the Society with most valuable collections of flora, artistically mounted. Miss

¹ *Journal and Proceedings of the Mueller Botanic Society of Western Australia* 1(5) (1900) 12.

Hussey also offered collection of European and South African algae.

Bickford chaired the collecting subcommittee on Myrtaceae, other members being J. Allen and J. Pearl. There were also committees for Epacridaceae (Tratman, A. Morrison and A. Purdie), Orchidaceae (E.W. Hursthouse), Stylidiaceae (C. Andrews and Tratman) and Proteaceae (Andrews, Hursthouse & B.Hendry). The Western Australian Natural History Society noted in its annual report for 1905 that it had purchased a cupboard to house the herbarium collections that it had presumably obtained from the Mueller Botanic Society. In 1906 the annual report notes that E.W. Hursthouse was ‘Curator of the Herbarium’. The Western Australian Museum commenced a herbarium in 1896 with the donation of 54 specimens. These were presumably the “very fine British Herbarium” of the Swan River Mechanics Institute that the WA Government purchased in 1892 and the Bureau of Agriculture may have had a collection of Poison Plants from 1894 (Underwood 2011). Few of these early collections survive.

However, Bickford also had powerful enemies. On 15th September 1901, an anonymous source wrote a blistering article in the *West Australian Sunday Times* (Web ref. 8) about the Society, which had received a government grant of 50 pounds to print and distribute the Journal:

a Botanic Society which really means a Bickford agency. The excursions are simply picnics at the people’s expense for the honour of Bickford.

and

Nothing new to Botanic science has ever been or could be discovered by any except one of its members¹⁷.

Perhaps this was due to the Society advertising its meetings in the *West Australian* as noted in the article.

Bickford appears to fade from prominence in 1904, a clue to this demise lying in a report in the *West Australian* on 23rd March 1904

¹ Presumably Alex Purdie since there is the comment that “Amongst the 200 we are assured on the best authority there is one botanist, and his name is Purdie. All the rest are “picnickers”.

(page 8, Web ref. 9) where it details the bankruptcy of Bickford’s furniture business, which was finally concluded in August 1905. Bickford was still a prominent member of the Methodist Church in 1908, the last mention I have found of him. Bickford does not appear in the *Australian Dictionary of Biography*, the *Bicentennial Dictionary of Western Australians* or the *Dictionary of West Australians*, nor is he mentioned in historical accounts on Western Australian botany by Gardner (1926) or Marchant (2005).

What happened to the collections? Upon checking those mentioned above in Australia’s Virtual Herbarium I can locate no collections by Allen, Kidson, Miss Cons, Hendry or Pearl. There are one by Tratman (1902), nine by Creeth (1 in 1900, 8 in 1917), 53 by Hursthouse (1902–1903, 50 in NSW and 3 in PERTH), and 27 early collections by Purdie (1900–1904, all orchids, earliest mainly NSW). There is no mention that I can discover in the local newspapers or the Annual reports of the Society of what happened to any collections prior to 1900. Both Green (1990) and Underwood (2011) note that the collection of the Mueller Botanic Society was apparently incorporated into the herbarium at the Western Australian Museum, but I can find no evidence of this. I would concur with John Green that these collections were not kept, including the early material in the Western Australian Museum; virtually the only ones that survive were sent out of the State.

In a bizarre twist it was perhaps fortunate that even those with semi-official roles such as Alexander Morrison were so poorly treated that they sent their material elsewhere, where it survived! In his brief note on Bickford, George (2009) notes that there are specimens collected by Bickford from New Norcia and Mount Eliza at Kew in the Herbarium of Alexander Morrison. Morrison had a personal herbarium of 50 cases which was bequeathed to the University of Edinburgh and now resides in Edinburgh Botanic Gardens (Anon. 1914 and Lamond & Bennell 1990); there are duplicates in PERTH, MEL and K. Lamond & Bennell (1990) do not list Bickford as a collector who contributed to Morrison’s collections and I have found no further evidence of any collections by E. Bickford

from Mount Eliza.

In summation it is sad that the collections, many made from areas of Perth that are now totally altered and where we have little idea of the original species or vegetation appear not to have survived. For example *Samolus bickfordiana* (type: “salt Marshes along the banks of the Swan River near Perth”), was last collected along the Swan River by Morrison at Claremont in 1899, and it is now locally extinct. The author would be very grateful if anyone has information about collections of *Samolus* by Morrison, Fitzgerald or Bickford from the Swan River if they could contact him as they may be the missing type!

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The new Summer Student Program of CSIRO's National Research Collections

Alexander N. Schmidt-Lebuhn (alexander.schmidt-lebuhn@csiro.au)

Last year, I reported in these pages on the summer student program of CSIRO Plant Industry (Schmidt-Lebuhn, 2014). In the middle of that year, however, the organisation underwent a restructure; Plant Industry was merged into the Agriculture Flagship, and the six biological collections managed by CSIRO on behalf of the commonwealth – herbarium, tree seed centre, insect collection, wildlife collection, fish collection and algal culture collection – were united into the National Research Collections Australia (NRCA).

One of the tasks after the restructure was to build up a new summer student, or, as they

are also called, vacation scholarship program across all of the collections. As before, it would be directed at advanced undergraduate students and offer them a paid scholarship and the opportunity to conduct a ten weeks long, self-contained research project under the supervision of a CSIRO scientist. Also as before, it was planned to include training courses and, on the second to last day, a symposium in the style of a scientific conference.

Despite being run in a new format for the first time, the program was very successful. Nine project ideas with very diverse topics were submitted by researchers from four different

collections and located at three different sites. That it was also immediately popular with students became clear when the selection committee received 84 applications, more than nine for each available scholarship. The successful candidates arrived at their projects sites in early December 2014 and finished their projects in February 2015.

The students and their projects

Three students worked at the Australian National Herbarium (ANH) in Canberra. Under the supervision of Cecile Gueidan, Farzana Kastury (UNSW) researched species delimitation in the soil crust lichen *Endocarpon* using molecular and morphological data. Among the more surprising outcomes of her project was that the name of an otherwise well known species of the genus has been misapplied for a long time, and that the species may consequently still be undescribed.

Kathryn McGilp (UQ; Fig. 1) worked with Lydia Guja on potential biases in seed collections undertaken for habitat conservation, trying to identify which traits might lead collectors to neglect or to prefer individual species.

The project of Meghan Castelli (Curtin; Fig. 1) under my own supervision dealt with chromosome numbers and genome sizes in the billy button genus *Craspedia*.

The results improve our understanding of the patterns of polyploidy in this group of plants but sadly dashed the hope that flow cytometry could be used as a short cut for inferring the ploidy level without chromosome counts.

Three projects were offered by the Australian National Insect Collection (ANIC) in Canberra. One was the description of a new beetle fossil from the Jurassic, conducted by Lauren Ashman (ANU) under the supervision of Rolf Oberprieler and Adam Slipinski. This was very popular among the applicants.

Brodie Foster (UQ) joined the lab of Andreas Zwick to find new butterfly and moth species, and in particular to compare

several computational approaches to species delimitation with molecular data. Among the outcomes of his project was the discovery of two undescribed moth species from southern Queensland and northern New South Wales.

Demonstrating that the insect collection has a wider scope than its name suggests, Laura Welsh (ANU) worked with Mike Hodda on the ecological, morphological and molecular diversity of nematodes. Her results demonstrate the utility of tail shape as a taxonomic character in the study genus.

The seventh project in Canberra took place in the Australian National Wildlife Collection (ANWC) under the supervision of Kerensa McElroy. In a study with a strong bioinformatics focus, Ayla Wilson (Edith Cowan) studied the genetic variation of Red-browed Finches using single nucleotide polymorphism (SNP) data.

At the Australian Tropical Herbarium (ATH) in Cairns, Vanessa Neale (JCU) studied the evolution of the Australian hammer orchids under the supervision of Katharina Schulte.

The final and also very popular scholarship had been offered for the description of a new species of sea moth (a fish group related to the seahorses) from the Great Barrier Reef. It

Fig. 1. During field work in the alpine zone of Kosciuszko National Park, Sarah Mathews of the Australian National Herbarium (left) points out *Podocarpus lawrencei* pollen cones to summer students Kathryn McGilp (middle) and Meghan Castelli (right).



was conducted by Deborah Osterhage (UTAS) under the supervision of William White at the Australian National Fish Collection (ANFC) in Hobart.

Symposium

Whereas the two students in Cairns and Hobart presented their results to the local research groups, a collective symposium was organised for the seven students in Canberra. It took place in the afternoon of 5 February 2015, providing an opportunity for NRCA staff and interested visitors from the Australian National Botanic Garden and the Australian National University to hear about the research undertaken during the program and to celebrate its successful conclusion. Around fifty participants joined the students in CSIRO's Waterhouse Lecture Theatre, and colleagues from the Australian Tropical Herbarium and the Australian

National Fish Collection participated per video conference.

Organised into a botanical and a zoological session with a coffee break in the middle, the students each gave 15 min talks with 5 min discussion time. The presentations would not have been out of place at a professional conference, and several of the sparked animated discussions. Leo Joseph, director of the Wildlife Collections, closed the symposium with the presentation of the certificates.

To obtain more information on the NRCA Summer Student Program, please email me.

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Illustrating regional differences and trends in the chronology of records of taxa

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State Herbarium of South Australia

¹Two useful attributes applied to taxa in plant, algal and fungal floras and censuses are their native or naturalised status and their conservation status. They are often determined at the broad level for an entire taxon across countries and continents, but in recent times they have been applied at the state and regional level and within parts of a taxon range (e.g. Barker & Barker 2005, Barker et al. 2005). Such attributions are fundamental to decisions on management of naturalised and threatened native taxa. However, at times statuses may not be clear (Barker & Barker l.c.; Bean 2007).

Examining the chronology of records from vouchered herbarium collections across the range of distribution of a taxon is an important basis for determining these statuses. Mapping and charting the data enhance such assessment. One way is to provide a series of distribution maps of records accumulated to the end of successive decades starting with

the decade that the taxon was first recorded. Such map series can be generated in the *Atlas of Living Australia* toolbox (Fig. 1; Web ref. 1), as illustrated in a recent publication on *Carrichtera annua* (Cooke et al. 2011).

We demonstrate here two other methods, one a scatter plot chart, the other incorporated into the standard distribution map, which portray the collection and/or observation dates of taxon records. For a naturalised species it can show its primary and any subsequent points of introduction. For indigenous species it can highlight the occurrence of early collections well away from centres of early colonisation that might indicate native status. And for threatened species it may show regional absences of more recent collections in parts of the overall range of distribution.

Purpose of this paper and caveats

We are wanting to introduce a prototype which we have limited capability to develop further.

We use examples illustrating where native or naturalised status is unclear or varies across a taxon range. We have made some effort to add data from old collections predominantly housed in overseas herbaria. A seamless

¹ We apologise to readers of hard copy version which is printed in black and white. The figures do read better in colour and we hope you can access the on-line version of this issue. Introducing contrasts in greyscale and symbol shape into these prototype diagrams are not a simple task for us.

link to a pool of these available data is sorely needed.

This method of portraying distribution may not resolve the question of the native or threatened status of some species, but it should assist in giving a more immediate geographical overview of record chronologies. We also discuss some improved chronological parameters and some resultant areas that might be worth investigating to see if they can provide further benefits in the rich dated occurrence records across the continent now accessible on-line.

Methods

Data for a selection of plant species were assembled from the *Atlas of Living Australia* spatial portal (Web ref. 1). For clarity of display data in the maps were confined to herbarium specimen records from the *Australian Virtual Herbarium* (Web ref. 2), but scatter plot data also included the available observational data. They benefit from the recurrent identification processes of herbarium specimens and spatial validation by ALA testing procedures. Taxa treated here are: two native species with a wider naturalised distribution, *Acacia cyclops* and *A. baileyana*; a widespread naturalised species *Parentucellia latifolia*; a widespread native species *Striga curviflora*; and a species of debatable native status *Bacopa monnieri*. Two of these species, *A. cyclops* and *B. monnieri*, have collections from the early 1800s (Bentham 1863–78) that are not represented by dated collections in the AVH/ALA datasets. We have added records for which we can estimate a close approximation of collection date from biographical and botanical literature. In these instances each is represented by an undated collection in the National Herbarium of Victoria (MEL).

Point distribution data for taxon collection and observation

Fig. 1. The source of polar angles used to position records in the charts showing the chronology of herbarium specimen and observational records around the Australian continent. In this example angles read clockwise from a polar axis which is the eastward radius.

records are presented in two forms:

- a chronological distribution map (in Mercator projection) with year of collection ranging from the 1700s to the present shown by circles of a continuously decreasing diameter; and
- a chronological distribution chart showing year of collection plotted against the polar angle, which is centred on the Lambert gravitational centre of Australia (Web ref. 3). This accommodates distributions that align around the Australian mainland coast. The polar axis (zero degree radius) lies due west (Fig. 1) or due east.

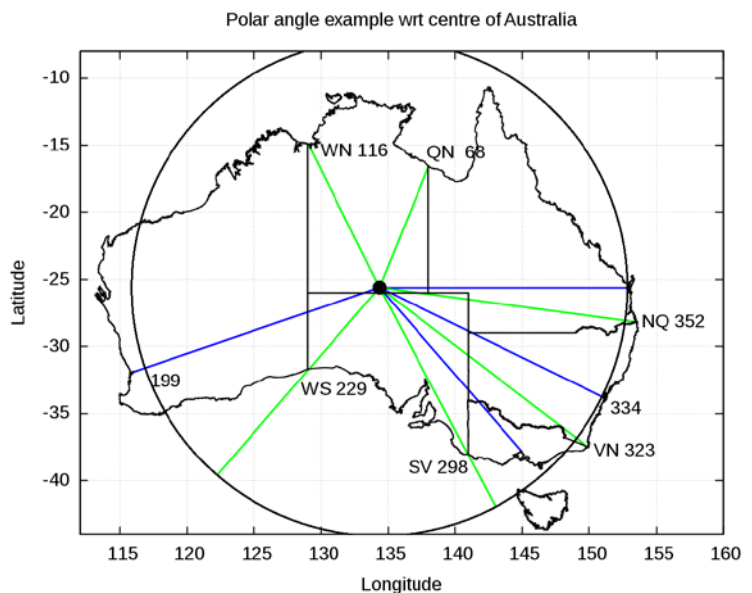
For some data sets a different centroid could be chosen (e.g. in Bass Strait for points encompassing Tasmania and Victoria), or they could be positioned in relation to latitude or longitude or to an optimally placed line of any length or angle.

The program has been developed by one of us (RC). The maps and plots of data from the above sources were created using the *gnuplot* package (Williams, Kelley et al. 2014).

Results

The maps produced usefully illustrate and, at times, add insights into the current wisdom about the age and origins of the following Australian species:

- *Acacia cyclops* and *A. baileyana* are native for only part of their range, having become naturalised elsewhere in Australia. Cowan &



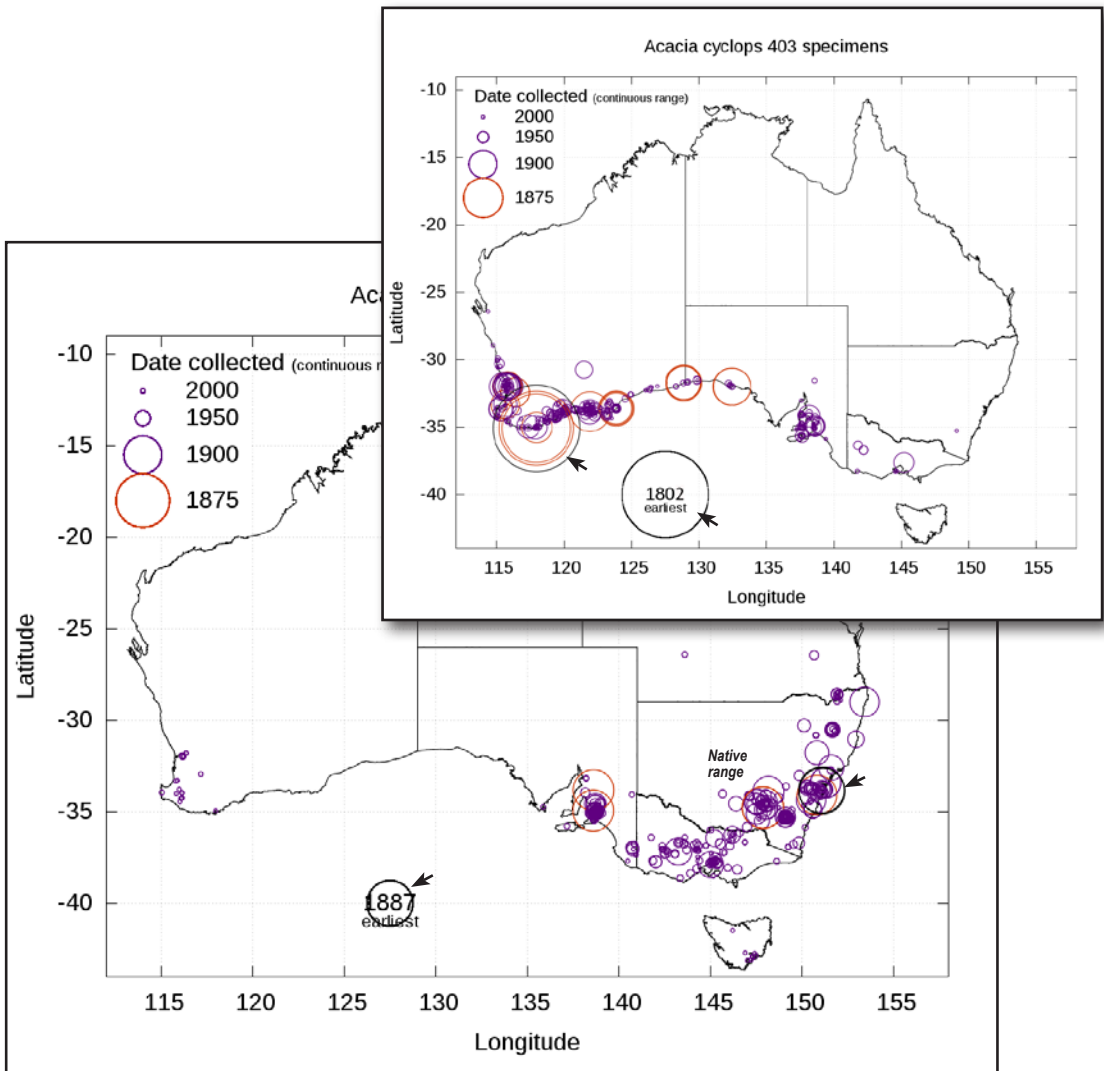


Fig. 2. Herbarium specimen records of two *Acacia* species mapped by year of collection, with the earliest collections coloured black, those of years prior to 1900 red, those after 1900 purple.

a (top). *Acacia cyclops*. b. (below) *Acacia baileyana*.

Data from Australia's Virtual Herbarium.

Maslin (2001) consider native populations of *A. cyclops* to include Yorke Peninsula, South Australia, but this map (Figs. 2a, 3a) suggests that the species is native only as far east as the Great Australian Bight. The chrono-map and -chart of widely naturalised *Acacia baileyana* (Figs. 2b, 3b) show well that, at about the time of its initial description from plants of unknown provenance in cultivation in Brisbane and of its first herbarium collection from its restricted natural range in the south-western slopes of New South Wales, it had already become established around Sydney and Adelaide (Tindale &

Kodela 2001).

- *Parentucellia latifolia* was naturalised in Australia in the 1870s in Perth, Adelaide, and Melbourne and commonly collected from then on (Figs 3a, 4a).
- *Striga curviflora* shows a scatter of early collections across its native northern Australian range (Fig. 3b, 4b).
- *Bacopa monnieri* is considered a native semi-aquatic in the eastern States (Barker 1992; Web ref. 4, 5). It is a recent introduction to south-west Western Australia and South Australia. Both the chronological distribution map and chart (Figs. 5a, b) show

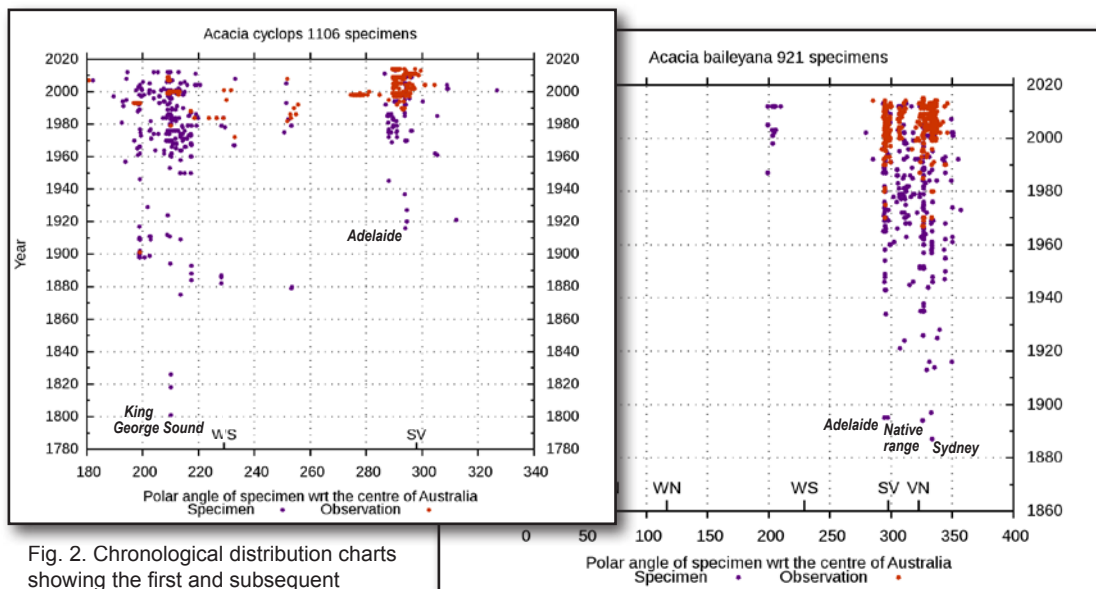


Fig. 2. Chronological distribution charts showing the first and subsequent herbarium specimen and observational records along polar angles clockwise from an eastward polar axis (as in Fig. 1). a (left), *Acacia cyclops*, b (right), *Acacia baileyana*.

Data from Australia's Virtual Herbarium and Atlas of Living Australia.

that collections of the species from the 19th century are spread along the east coast of the continent. Early records are: Moreton Island in 1847 and Ne[e]rkoool Creek, Burnett River in 1856. Woolls's collections from Parramatta are unmentioned in his "Plants of Parramatta" (Woolls 1867), but are cited in Bentham (1869); they are therefore dated here as around 1868. There do not seem to be earlier records. Was it rare enough to have been missed by both Banks and Brown?

What next?

We are not equipped to develop this prototype application to its full potential and in any case it would benefit from feedback. It would be ideally built into the powerful toolbox of the ALA with its immediate access to rich datasets and other applications.

The chronologies illustrated are founded on the *year of recording* (y_r) of the collection or observation. For assessment of whether a species is native or naturalised, this is often a poor surrogate of how long a taxon has existed in a location. Could a variable be developed that accounts for the substantial variation across the Australian continent in when a reasonable regional floristic knowledge was achieved?

For example, the bulk of current vouchered knowledge of the vascular flora of the Gibson Desert or a remote part of the Kimberley might have only been achieved in the late 1900s (it may not matter much that many are still to be found), while many of the species in the Sydney region may have been collected at some time during the 1800s. If it were determined that the increase in knowledge of unit areas (e.g. degree by degree grid cells) across Australia tapered off at a level of 90%, we could determine a *base year of floristic knowledge* (y_{90}) by which 90% of current floristic records in a unit area were represented by a herbarium specimen from the region¹. Each record could be accorded a value Δ_y , being *the number of years before or after the base year of the unit area occupied* ($y_{90} - y_r$).

If degree grid cells are too fine a scale for the data, perhaps IBRA (and IMCRA) regions may be an alternative worth trying.

Plotting collection localities using Δ_y values in chrono-maps and charts similar to those illustrated here would be useful to try. The results might prompt further refinements.

The timing of the spread of European occupation and impact across the continent leading to plant introductions is clearly an issue in estimating whether a plant already occupied a unit area. What might a focus on just the earliest well-collected regions tell us? Could the year a unit

¹ The definition of this parameter may vary for major taxonomic groups (flowering plants, bryophyta) or even physiognomies (e.g., trees and shrubs, herbs).

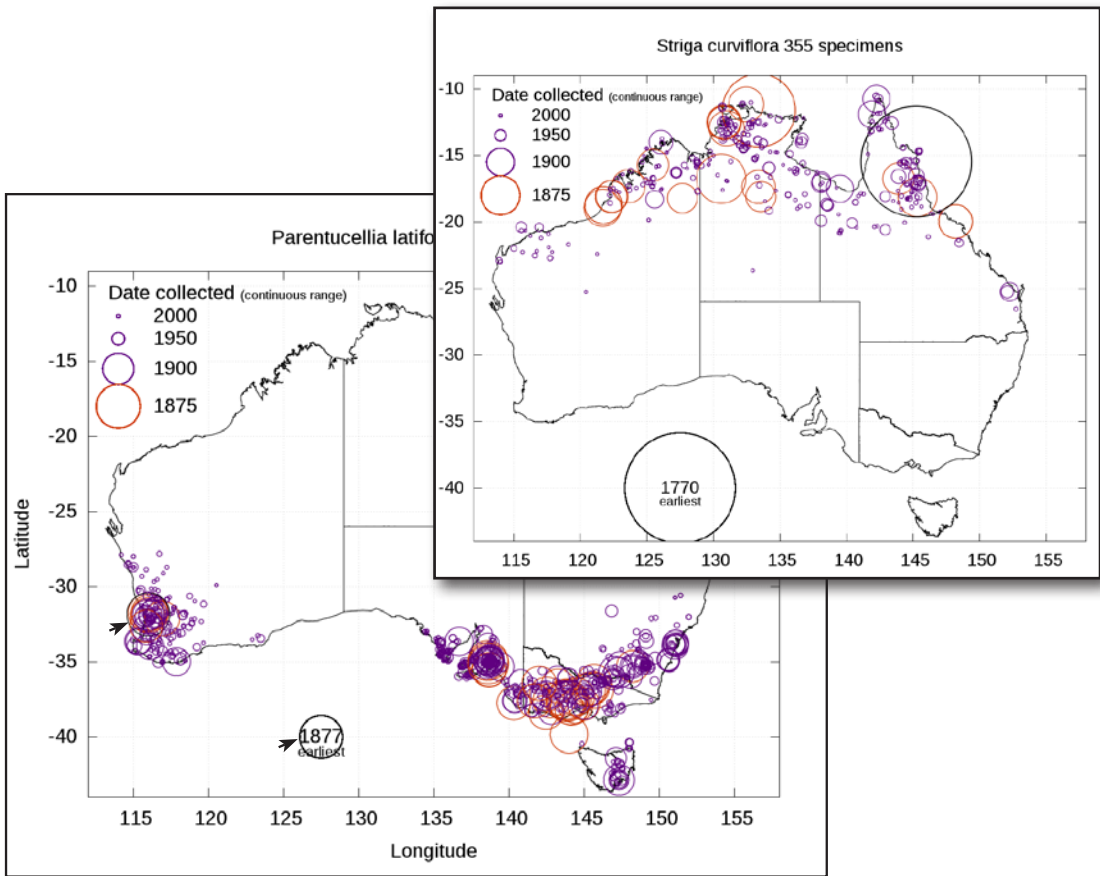


Fig. 3. Herbarium specimen records of two southern Australian naturalised herbs mapped by year of collection, with the earliest collections coloured black, those of years prior to 1900 red, those after 1900 purple. a (left), *Parentucellia latifolia*, b (right), *Striga curviflora*. Data from Australia's Virtual Herbarium.

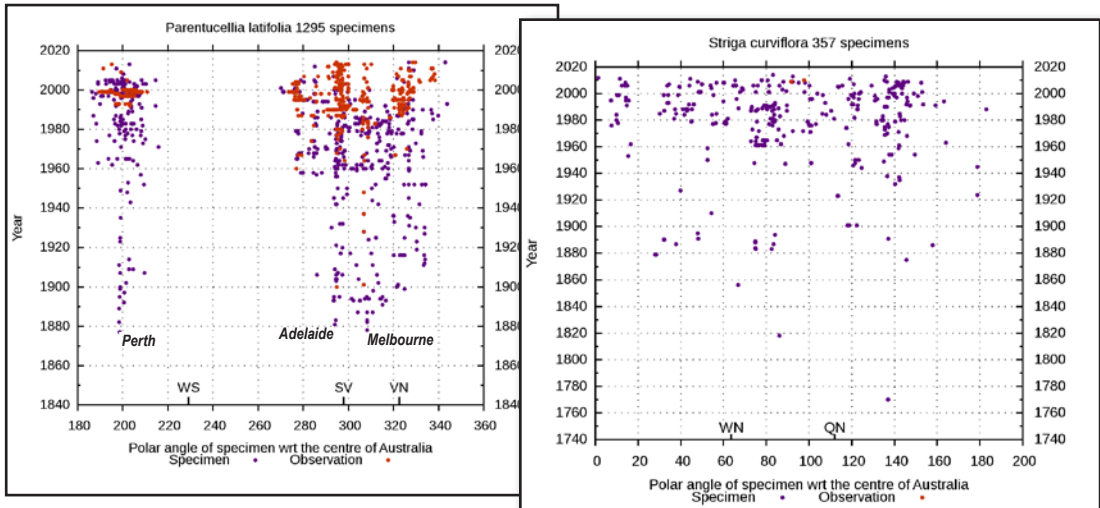


Fig. 4. Chronological distribution charts showing the first and subsequent herbarium specimen and observational records. a (left), naturalised *Parentucellia latifolia*. b, native *Striga curviflora* (note the paucity of collections prior to the 1850s). Polar angles which are clockwise from an eastward polar axis in a (as in Fig. 1) and anticlockwise from a westward one in b.

(Data from Australia's Virtual Herbarium and Atlas of Living Australia).

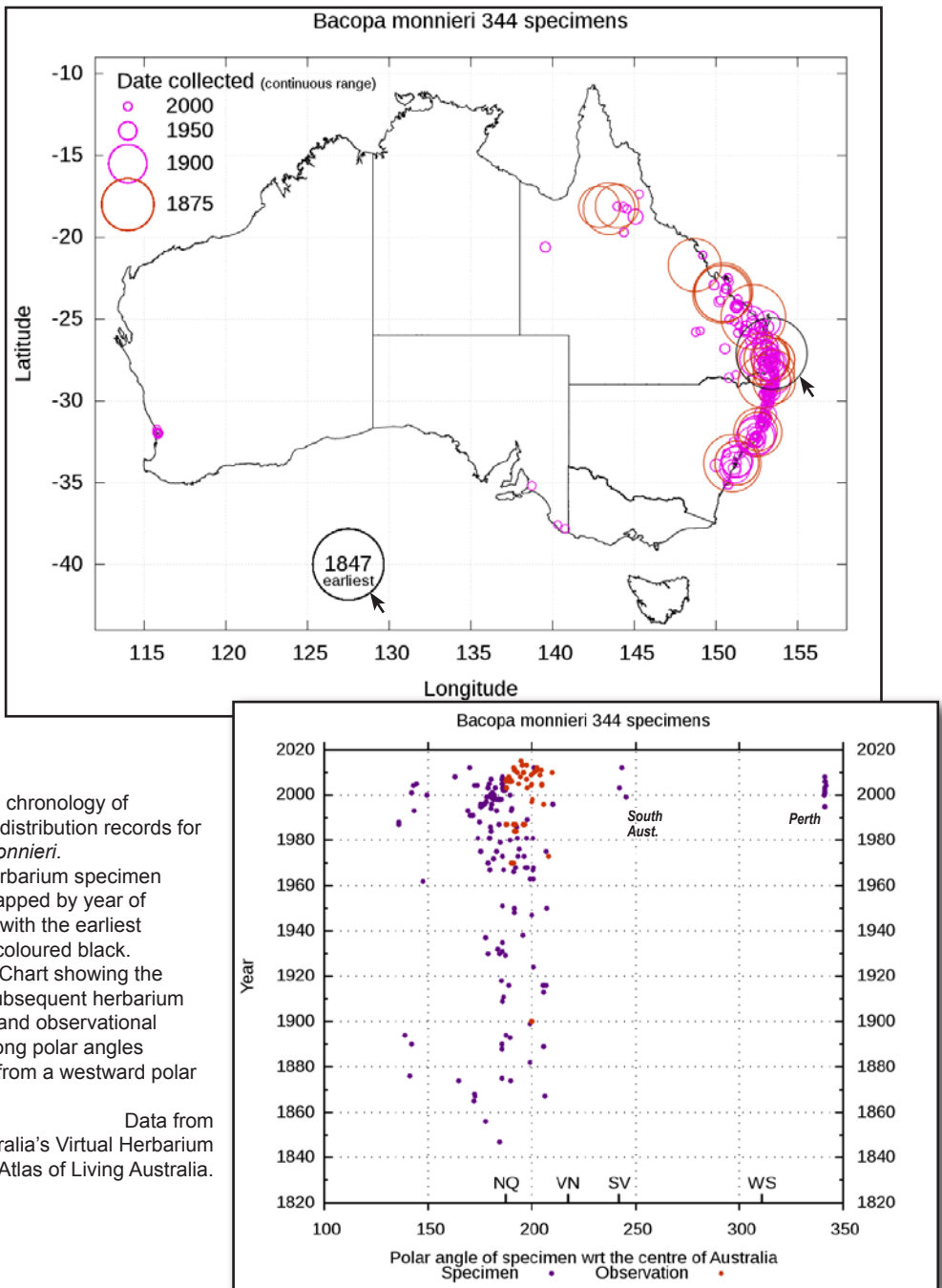


Fig. 5. The chronology of Australian distribution records for *Bacopa monnieri*. a (top), Herbarium specimen records mapped by year of collection, with the earliest collection coloured black. b (below), Chart showing the first and subsequent herbarium specimen and observational records along polar angles clockwise from a westward polar axis.

Data from Australia's Virtual Herbarium and Atlas of Living Australia.

area was first visited by European botanists be utilised in some way?

A parameter reflecting the probability that a taxon is native to (or naturalised in) a country or region in all or parts of its range would be very useful. But it may be less reliable for highly localised species compared with widespread

ones, which allow for a statistical appraisal allowing for chance absences in numbers of unit areas.

Perhaps others may have better ideas or there is more in the literature that could be taken into account in further developing this. Perhaps it has all been tried before!

Acknowledgments

Robyn Barker and Jane Prider are thanked for supplying references to broader weed literature and the example of plotting distribution chronologically.

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The range of *Scrophularia* (Scrophulariaceae) significantly extended in Australia

W.R. (Bill) Barker & Chris J. Brodie
State Herbarium of South Australia

Two species of the Northern Hemisphere genus *Scrophularia*, *S. nodosa* and *S. auriculata*, have been localised adventives for many years in New South Wales and Tasmania, respectively. They have been found in recent times along creeklines in South Australia's Mount Lofty Ranges.

These significant extensions in range seem worthy of publicity to provide diagnostic attributes and promote awareness of potential threat to catchments. Diagnostic detail is based largely on South Australian observations and collections in the State Herbarium (by WRB) but they are put in an Australian context through earlier flora documentation (WRB and others), access to the AVH and, in the case of *Scrophularia*, a visit by CJB to HO, MEL and NSW herbaria, and by recourse to the collections data accessed via the *Australia's Virtual Herbarium* (Web ref. 1).

Both species have quadrangular main

branches with a narrow wing at each angle, and many reduced cymose inflorescences of (1–) 4–7 flowers arranged in open terminal panicles.

Key to the two species of *Scrophularia* naturalised in Australia

- A. Stem wings c. 0.5–1.0 mm wide; leaf blades sometimes with an opposite pair of small lobes at base, sub-crenate, the apiculate teeth obliquely obtuse to rounded. Rachises and pedicels with subsessile glandular hairs. Calyx lobes with scarious margins c. 0.5–0.9 mm wide, particularly at apex where often fractured. Staminode apex suborbicular, not emarginate. Capsules compressed, broadly ovate in outline across the two united valves.
- S. auriculata* L.
- A. Stem wings c. 0.3 mm wide; leaf blades without basal lobes, serrate with the apiculate teeth acuminate or narrow acute. Rachises and pedicels glandular hairy, the stalks 0.1–0.2 mm long. Calyx lobes with narrow scarious margins c. 0.1 mm wide, denticulate. Staminode apex much wider than long, truncate to emarginate. Capsules not compressed, ovoid to subglobular.

S. nodosa L.

***Scrophularia auriculata* L.**

S. aquatica auct. non L.: Curtis, *Stud. Fl. Tasm.* 515 (1967).

As well as being known in north-east Tasmania for many years (Curtis 1967), there is a single recorded occurrence in 2007 in the lower Yarra Valley, Victoria. In South Australia the species occurs in the Cox Creek watershed near Mount Lofty where it has spread to a number of sites (see below).

The species has been cultivated for some years in the Mount Lofty Botanic Garden where it has a propensity to spread (S. Kingdon & R. Hatcher, pers. comm. 2013). This could be the source of the Cox Creek infestation; the creek is only a few hundred metres away and the nearest population less than two kilometres away.

Selected specimens examined. SOUTH AUSTRALIA:

W.R. Barker 8996, 5 Nov 2009, Mt Lofty Golf Course, creekline on 8th hole fairway, AD; *R.J. Bates* 60499, Feb 2003, Cox Creek, Woodhouse [=Woodside], by bridge under Old Carey Gully Road, AD; *C.J. Brodie* 4717 & *P. Cramond*, 11 Dec 2012, Nr Mylor at end of Feder Rd on river bank of Onkaparinga, AD. CULTIVATED, BUT ARGUABLY ESTABLISHED: *C.J. Brodie* 4747, *P. Cramond* & *S. Kingdon*, 14 Feb 2014 Mt Lofty Botanic Gardens in the bog garden bed, AD. VICTORIA: *G.W. Carr* 0705-56, 11 May 2007, Yarra River (S bank) between Sweenys Flats and Fitzsimmons Lane, Templestowe, MEL. TASMANIA: *G. Medwin* s.n., 4 Mar 1966, Black River, near Smithton, HO108644; *D.I. Morris* 86299, 23 Dec 1987, Rifle Range Creek, opposite Herbarium, HO.

***Scrophularia nodosa* L.**

Known since the 1960s in New South Wales for 50 years (Barker 1992, Carolin & Tindale 1993), this species is once recorded from a site near Mylor in the Mount Lofty Ranges, but this population may have died out as it has not been relocated in subsequent visits.

Selected specimens examined. SOUTH AUSTRALIA:

R.J. Bates s.n. 30 Jan 2001, Ilert Rd Swamps Mylor, AD135978. NEW SOUTH WALES: *E.J. McBarron* 7617, 16 Mar 1963, Macquarie Rivulet, Albion Park, NSW; *P. G. Kodala* 164, *T. A. James* & *M. Westmacott*, 15 Mar 1992, Doradell, c. 1.5 km S of Robertson, NSW, AD.

South Australian weed risk assessment

From observations by CJB with others *S. auriculata* has spread along Cox Creek and is aggressively taking over the immediate riparian vegetation where it forms monocultures excluding the vast majority of native plants and even other aggressive weeds. Further investigation has revealed it has spread

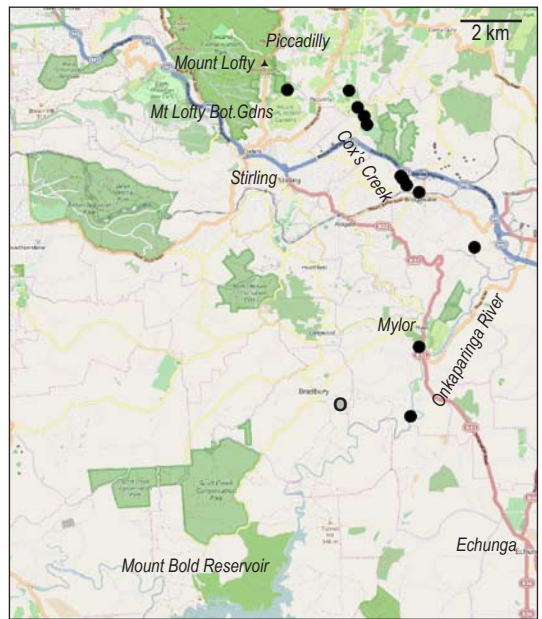


Fig. 1. Distribution of *Scrophularia* species in South Australia (*S. auriculata* ●, *S. nodosa* ○); from collections in State Herbarium of South Australia.

Base map generated from Atlas of Living Australia.

downstream into the Onkaparinga River. It appears increasingly likely that the species will spread down the remaining length of the river, which is a major water source for the human population.

A weed risk assessment for *S. auriculata* was carried out by an expert panel on 21st January 2013. *S. auriculata* was treated as an aquatic weed as it appears to grow in riparian situations. A Comparative Weed Risk score (Virtue 2008) of 234 was reached by the panel. This translates as a high risk weed in riparian environments and weed control methods should be aiming for eradication of *S. auriculata*.

What sort of threat is *S. nodosa* to catchments in South Australia and other Australian states? While evidence of its establishment should continue to be sought in South Australia, it seems better dealt with as a casual escape of less concern.

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The First World War and its effect on botany and broader science in Australia

Robyn Barker
State Herbarium of South Australia

In keeping with the marking of the centenary of Anzac in April this year, it seemed appropriate that we also mark it in some way, although it will have to be pretty low key as this is a very broad topic and there doesn't appear to have been much analysis of just how the scientific, and particularly the botanical, world was effected. Hopefully any oversight will be pointed out and can be included in the next Newsletter! Or perhaps it might stimulate someone to do some research into this time.

The premier scientific body in Australia at the time of the 1914-1918 was the Australasian Association for the Advancement of Science, which had been formed in the late 1880s, its first meeting being held in Sydney in 1888. By the time 1914 had arrived they had held 14 meetings, the last of them in Melbourne in January 1913¹. There would not be another meeting until 1921 (Web ref. 1) and while officially that meeting was to be held in Hobart, it was actually held in Melbourne at very short notice, because of the activities of the maritime union at the time. That the whole conference was reorganized in two short weeks and by a woman² was sufficiently novel for it to be noted by the president Baldwin Spencer in his address.

¹ Apparently they did not include the meeting that they held with the British Association for the Advancement of Science in August 1914 as an official meeting.

² Dr Georgina Sweet (1875-1946), Australia's first female Acting Professor (Biology, University of Melbourne, 1916-1917) (Web ref. 2). She would have been the Associate Professor of Zoology at the University of Melbourne at the time of the conference. In 2010 the Prime Minister announced the new Georgina Sweet Australian Laureate Fellowship for science and technology to be awarded by the Australian Research Council (ARC). It is specifically designed to address the low proportion of applications to the scheme by female researchers.

The war has taught us what women are capable of in regard to organization, and in the arrangements now made we have once more to recognize their efficiency, and to realize that they are a tower of strength and an ever-present help in time of trouble.

It is interesting to look at the accounts of each of the sectional presidents at their 1921 meeting for their summaries of what had changed in their particular branch of science in those intervening years. For instance Douglas Mawson (p. 145) in his view of the current geographical outlook expounded on the advances in map-making, the appointment of the first Professor of Geography in Sydney and the lack of any adequate vegetation maps for Australia. He also (p. 286) presented a report on his Antarctic Expedition, indicating that when he returned to Australia in March 1914 he was out of pocket by £5000, a figure which would normally be easily covered by the production of a popular book, by lectures and by the sale of cinematographic rights, with enough left over to produce a report of the expedition, but of course the advent of war put paid to most of that.

Professor W.N. Benson's topic was recent advances in New Zealand Geology (p. 45) but he took time to list those of the profession who had been lost and their contribution to their field while Chemistry's Professor Wilmore reflected on the present position of chemistry and chemists, with many examples of the use of chemistry and the training of Australasian chemists in Britain during the war³.

Alfred Ewart, President of the Biology section, indicated in his address entitled "Biology

³ Chemistry was not a protected occupation and many British chemists were lost before their necessity was realised. Australian chemists filled this void and of course brought their skills with them when they came back to Australia after the war.

during the war and after” that as

an aftermath of the waste entailed by war we are now passing through a time of economic stringency and are suffering from a phase of general unrest in our social system.

Following a summary of the botanical and zoological work carried out during the war years he indicated finally that for the botanical work

attention may be directed to the preponderance of systematic and economic work, and to the deficiency of scientific work on some of the deeper aspects of the subject.

Just why there should have been more systematic work is not clear – perhaps it was because systematists then, as now, are used to doing their work with little support and the need for little more than a microscope and access to collections. Perhaps it was because most systematists were older and therefore not caught up in the pressures to enlist. A quick review of all of the journals of the Royal Society for each of the states at the time indicates that none of them ceased production throughout the war and many of them did indeed have papers describing new species, but whether this was at the expense of other more “scientific” papers requires further assessment.

Ewart then moved on to a subject which he was now presumably able to discuss since he was giving up his position of Government Botanist of Victoria to become a full time academic – the governance of science. Much of what he had to say is of relevance today since it involves the early days of CSIRO and has been reproduced here.

One beneficial result brought about by the great war was a general scientific awakening and public realisation of the important, and indeed essential, part of which science and scientific activity play in national security. Although this becomes more obvious and urgent during war, it is no less important during peace, which a cynic has described as a period of exhaustion and recuperation, necessary to recover from the last war and to prepare for the next. Evidence of the awakened interest in science, a realisation of its importance was afforded by the establishment of the Bureau of Science and Industry¹. The Bureau still remains in a condition

of little more than suspended animation and cannot possibly do the great things that were expected from it, so long as the funds required are not available. No public protest has been made against the non-fulfilment of the promise to raise Australian science through the Bureau to a high standard of activity and excellence. Overworked University teachers are still expected to bear the main burden of scientific research and to keep the torch of science burning, often at their own cost. The general public usually considers that it is the duty of a scientific man to carry on research for the general benefit in his spare time, whether he has any or not, and often has the impertinence to criticise him if he turns his endeavours to problems which interest him, instead of those which are obvious and immediate practical utility, but which do not happen to interest him. As a matter of fact, by attacking problems which are of scientific interest, he is usually doing what will ultimately be of the greatest benefit, for it is well known that the difficult abstract scientific problems of one generation often become the commonplace utilitarian realizations of the next. If scientific work were confined to those problems which were of immediate practical utility it would soon reach a series of dead ends from which no further progress was possible.

This is, in fact, one of the dangers of allocating scientific work wholly to government departments, which must, of necessity, largely or wholly confine themselves to economic and directly utilitarian scientific work...

Science cannot be worked in rigidly watertight compartments, and scientific research is always essentially individualistic. Bureaus and committees, as such, never have done, and never will do, any scientific research. What they can do is to encourage, to correlate, to subsidize, to guide and control, to make public new work, and to bring new principles into practical use. If government bureaus and scientific departments turn their energies in this direction they can do great and useful work for science, but if they are expected to take over all scientific work, academic and utilitarian, they will fail woefully, for there must always be in all the sciences a large body of free and unharnessed workers if they are to progress.

¹ The fledgling CSIRO founded by an act of

Parliament in 1920.

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2. <http://adb.anu.edu.au/biography/sweet-georgina-8728>

The 1914 visit to Australia by the British Association for the Advancement of Science

Robyn Barker
State Herbarium of South Australia

In what turned out to be very bad timing, the British Association for the Advancement of Science met with their Australasian equivalent in Australia in August 1914, just days after the declaration of the First World War¹. Three hundred delegates came to Australia largely at the cost of the Australian Commonwealth and State governments with some arriving early and spending time in Western Australia. Proceedings started officially in Adelaide on 8th August with a meeting of four days, followed by meetings in Melbourne and Sydney, each of them for seven days, and finally Brisbane for four days. There had been some unofficial meetings in Perth in the previous two weeks involving the “Advance Party” who were mostly involved in field work in that state and there was also a visit to Tasmania by some of the delegates at the conclusion of the meeting. A long-standing invitation from the New Zealand Government for the end of the meeting had to be largely aborted due to the commencement of war.

Accounts of the botanical excursions as well as the papers presented can be found in early editions of the *New Phytologist* (Saunders 1915, Thomas 1915) or you can read the Association’s full Report of the meeting (Web ref. 1). The “narrative and itinerary of the Australian meeting” (p. 679) has a very detailed account of the arrangements and organisation involved in the travel to and from Australia and then the accommodation, travel and meetings within Australia. All three ships involved in bringing most of the delegates to the meeting, the Orient’s *RMS Orvieto* (departed London July 3rd via Suez), Blue Funnel’s *s.s. Ascanius*² (departed Liverpool June 22nd via Cape Town)

and the Aberdeen’s *s.s. Euripides* (departed London July 1st) were requisitioned on arrival and converted by the Australian Government for the war effort, leaving the delegates to make new arrangements for their safe return to Britain. The three requisitioned ships were to later assemble with the first convoy at King George’s Sound, Albany, Western Australia on 1st November 1914 and to be involved in transporting the First Detachment of the Australian and New Zealand Imperial Expeditionary Forces to Egypt (Web ref. 2).

Examples of botanical papers presented at the meetings can be seen below while A.B. Rendle’s personal account of his visit, which includes comments on the vegetation as well as the meetings in Australia and New Zealand can be seen in the *Journal of Botany* (Rendle 1915).

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Web ref. 1: <https://archive.org/details/reportofbritisha15adva>

Web ref. 2: <http://www.flotilla-australia.com/hmat.htm>

Appendix:

Botanical papers presented at the meeting

Modern Derivatives of the Matonioid Ferns. By Professor P. O. Bower, ScB., F.R.S., University of Glasgow.

On the Systematic Position of Casuarina and its Allies. By Emily M. Berridge, D.Sc, F.L.S., Imperial College, London.

Description of some Fossil Fruits. By Bertha Rees, Lecturer in Botany at the University of Melbourne.

¹ War had been declared on the 4th August

² This was the ship on which Eric Wilkes Talbot-Smith, Philip Short’s and my great-uncle, embarked in Adelaide on 20th October 1914 as part of the 10th Infantry Battalion. He was wounded on the first day on Gallipoli, dying on 30th April in Alexandria, Egypt.

The Origin of Species. By Dr. A. B. Rendle, F.R.S.,
Keeper of Botany, British Museum Natural
History.

The Geographical Distribution of the Sea-grasses.
By Dr. C. H. Ostenfeld, Danish systematist,
Copenhagen.

*The Fossil Plants discovered by Captain Scott's last
Expedition in the Antarctic Regions*. By Professor
A. C. Seward, F.E.S., Cambridge University.

*Relationship of Fungus and Alga in the Lichen-
thallus*. By Miss A. Lorrain Smith, lichenologist,
British Museum Natural History.

*The Contamination of Drinking Water by Algae and
its Removal*. By Professor T. Johnson, B.Sc.,
Visitor.

*The Species Concept, with especial reference to
Eucalyptus*. By J. H. Maiden, Sydney Botanic
Gardens.

*The Correlation between the Specific Characters of
the Tasmanian and Australian Eucalypts*. By E.
T. Baker, F.L.S., and H. G. Smith, F.C.S.

Notes on the Evolution of the Genus Eucalyptus. By
E. H. Cambage, F.L.S., New South Wales.

The Vegetation of Gondwana Land. By Professor A.
C. Seward, Sc.D., F.R.S., Cambridge University.

*Types of Vegetation on the Coast in the
Neighbourhood of Adelaide, South Australia*. By
Professor T. G. B. Osborn, Professor of Botany,
University of Adelaide.

*On the Xerophytic Characters of Bossiaea
scolopendria (Sm.)*. By A. G. Hamilton, New
South Wales.

The Spores of Basidiomycetes. By J. Burton Cleland,
M.D., New South Wales.

A Botanical Survey of North-East New South Wales.
By Frederick Turner, F.L.S., F.R.H.S., New South
Wales.

Point of view

The status of *Bidens* (Asteraceae) in Western Australia and Australia

Greg Keighery

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Locked Bag 104, Bentley Delivery Centre, W.A., 6983

The taxonomy of *Bidens* has been described as “chaotic”, and it is not clear how many taxa are included in its bounds. There are probably at least 150 to 250 species, and some estimates fall around 230. Several annual species with animal dispersed fruits are widespread weeds of tropical and subtropical regions of the world.

Recently Orchard (2015) has revised the tribe Coreopsideae, including the genus *Bidens* for Australia. There appear to be a series of potential inconsistencies in the treatment of the native or naturalised status around these genera.

Status of *Bidens* in Australia

In the treatment of *Bidens*, six species are recognised of which three are definitely naturalised: *B. alba*, *B. aurea* and *B. tripartita*. The other three species, *B. bipinnata*, *B. pilosa* and *B. subalternans*, are a complex of weedy species and now, with the work of Orchard (l.c.), a native variety, largely confined to Western Australia.

Status of *B. bipinnata*, *B. pilosa* and *B. subalternans*

B. bipinnata: Orchard notes:

The species is here treated as naturalised,

although its arrival was certainly pre-European. Robert Brown collected it on Pibasoo Island in the N.T. in 1803. As the species is considered native to E. Asia, its occurrence in Australia might be considered native also.

B. pilosa: Orchard notes :

This species is regarded as naturalised in Australia. However, it was collected by Banks and Solander at Botany Bay in 1770, suggesting that it is of pre-European introduction. Perhaps via New Guinea.

B. subalternans: Orchard recognises this segregate species of *B. bipinnata* (Table 1). He notes:

the differences between *B. bipinnata* and *B. subalternans* as recognised in Australia are largely quantitative rather than qualitative. Nevertheless two entities seem to exist, albeit linked by intermediates. ... It is possible that all these taxa should be amalgamated in a single species.

Orchard also recognises three varieties in Australian material of *B. subalternans*. The differences as expressed in Table 1 appear to hold for material of var. *subalternans* and var. *simulans*, but not for the newly described (and

purportedly native) var. *araneosa*, where the inner bracts are stated to be purplish-brown, with numerous indistinct purple veins.

This leaves one with the very odd situation of a weed whose native range is known to be from Uruguay to Central America, having a disjunct native variety in Australia. Orchard's comments on var. *simulans* add to the confusion:

var. *simulans* is almost entirely an ephemeral and localised taxon, found in sheltered habitats in native vegetation, and as such might be considered native, or at least naturally adventive of long standing.

Contrast this to the treatment in the same volume of *Glossocardia*, a genus closely related to *Bidens*. All species are treated by Orchard as native, including the pantropical *G. bidens*, despite the note under this species:

The pantropical *G. bidens* has been variously described as native or naturalised in Australia. It is certainly pre-European in origin, as it was collected by Banks and Solander on the east coast in 1770 and by R. Brown at Sydney and northern Australia in 1802–05. It is well established in New Guinea and has almost certainly been carried from there into Cape York at various times.

The supposition is that the species is native to Indonesia/New Guinea and has been naturally introduced to Australia and is hence native.

If *Bidens bipinnata* is native to E. Asia (*eFlora of North America*, *eFlora of China* both accessible via Web ref. 1), then based on the logic used for *Glossocardia*, *B. bipinnata* could be listed as native. However, the consensus of numerous reviews and floras appears to view *B. bipinnata* as native to East

Asia (on the other hand, many publications list the species as native only to the Americas!), but *not* Indonesia or New Guinea and introduced to North and South America, Africa, Europe, Asia and the Pacific. Using the guidelines proposed by Bean (2007) a species secondarily introduced into Australia from an area (New Guinea or Indonesia) in which it is alien to, is also alien to Australia.

All floras and revisions, e.g., Tadesse (1994) note that *B. pilosa* is a South American species widely naturalised in tropical areas.

The situation with *B. subalternans* is confusing. All floras either treat *B. subalternans* as native to the Americas and introduced elsewhere, or as a part of the *B. bipinnata* complex, but still native to South America. While it is possible that this species was introduced to Asia, via contact with the Americas in the 1500/1600s and thence to Australia via long distance dispersal, there would not have been enough time for a widespread native taxon to evolve.

It appears that only *B. bipinnata* is regarded as native to East Asia, but questionably not elsewhere in Asia. This species could have been introduced to Australia from weed foci in Asia via natural agents, and may be regarded as at least a long established, questionably integrated, alien. If it could be established that the species range included SE Asia, then it is possibly a native taxon (at least in part).

It is also possible that the variant described by Orchard may be better placed in *B. bipinnata*, in which case a case could be mounted for native status, based on the above discussion. Everett (1992) states that *B. subalternans* in New South Wales has a distinctive maritime variant, perhaps indicating either multiple introductions, great phenotypic plasticity or

Table 1: Characters separating *Bidens bipinnata* and *B. subalternans*.

	Leaves	Outer involucre bracts	Inner involucre bracts	Pappus
<i>B. bipinnata</i>	Lobes rhombic to broad lanceolate Hairs only on veins on lower surface	Blunt or tapering, not dilated at tip. Peduncles and margins ciliate with spreading hairs	Purplish-brown, with numerous indistinct purple veins. Shorter than outer involucre bracts	Awns erect
<i>B. subalternans</i>	Lobes ± linear to lanceolate Hairy on lower surface	Slightly dilated at tip, Peduncles and margins glabrous or with scattered small coarse white hairs extending onto capitula and peduncle	Cream, with numerous distinct purple veins. Longer than outer involucre bracts	Awns spreading

long term residency of this complex.

Finally no part of the genus *Bidens*, including var. *araneosa* is regarded as well integrated into the native ecosystems in Western Australia. This is especially so in the Pilbara where it is aggressively invading and displacing species rich herbfields under Mulga communities, usually aided by cattle dispersing the fruits.

All other species and variants are South American natives secondarily introduced from parts of the naturalised range in Asia and should be listed as naturalised, including the segregate of *B. subalternans*.

Conclusions

The only solution to this problem is:

- resolution of the identity of material currently ascribed to *B. alternans*, based on the type and other material from South America and genetics. Is *B. alternans* part

of the *B. bipinnata* complex?

- resolution of the current native range of *B. bipinnata*.

Until this is achieved the only logical course of action is to consider all members of the genus *Bidens*, including *B. subalternans* var. *araneosa* as naturalised in Australia.

References

- Bean, A.R. (2007). A new system for determining which plant species are indigenous in Australia. *Australian Systematic Botany* 20: 1–43.
- Everett, J. (1992). *Bidens* in *Flora of New South Wales*, Vol 3. Ed. G. Harden. New South Wales University Press, Sydney, pp. 278–279.
- Orchard, A.E (2015). Coreopsidae. *Flora of Australia* 37 (Asteraceae 1). Ed. A Wilson, pp. 446–470. ABR/CSIRO, Australia.
- Mesfin Tadesse, (1994). An account of *Bidens* (Compositae: Heliantheae) for Africa. *Kew Bulletin* 48(3): 437–516.
- Web ref. 1. www.efloras.org

News

News from the West

Fans of fan flowers and keen wildflower photographers may like to participate in the latest venture of the Goodeniaceae Working Group. To assist with their studies on floral evolution in Goodeniaceae, the group are crowd-sourcing floral images for a morphometric study. Join the fun on *flickr* (Web ref. 1). Full details of the project, including contact details and the types of images required, can be downloaded from the Jabaily Lab website (Web ref. 2).

In staff news, Terry Macfarlane has recently moved to Perth from Manjimup and is now based at the Western Australian Herbarium. Another significant local move is the resignation of Kingsley Dixon from his position as Director of Science at the Botanic Gardens and Parks Authority (Kings Park) to take up a personal research Chair at Curtin University in the School of Environment and Agriculture.

For those looking for an excuse to head west, a joint conference of the Society of Australian Systematic Biologists and Invertebrate Biodiversity and Conservation group will be held this year in Fremantle from December

6–9 (the week following the ASBS conference in Canberra) (details at Web ref. 3).

Web references

1. <https://www.flickr.com/photos/129717607@N08/>
2. <http://jabailylab.org/wp-content/uploads/2015/03/GoodeniaceaeHandoutAGG.pdf>
3. <http://www.sasb2015.org>

Juliet Wege
Western Australian Herbarium

New Zealand Plant Radiation Network

The New Zealand Plant Radiation Network (NZPRN) is an informal group of researchers who study species radiation in the New Zealand flora, and is open to everyone interested in plant evolutionary biology. Check out the latest regarding publications, news, people and events on the NZPRN wiki (Web ref. 1) and by “liking” our facebook page (Web ref. 2). For example, if you missed the ASBS meeting last year but would like to see the opening plenary talk, “Next-generation, integrative, collaborative systematics” by Heidi Meudt, a pdf of the talk and related papers are all available for download on the NZPRN wiki (Web ref. 3). If you are interested in contributing to the wiki, please

email Andrew Clarke (acc68@cam.ac.uk) or me. It would be great to see more trans-Tasman conversations and collaboration between ASBS & NZPRN!

Web references

1. <https://nzprn.otago.ac.nz/NZPRN/WebHome>
2. <https://www.facebook.com/groups/177561788444/>
3. <https://nzprn.otago.ac.nz/NZPRN/PeopleMeudt>

Heidi Meudt
heidim@tepapa.govt.nz

Report of the Melbourne nomenclature sessions published

For those of you who would like to relive it again or for those of you who were unable to attend, the official Report on the deliberations and decisions of the ten sessions of the Nomenclature Section of the XVIII International Botanical Congress held in Melbourne, Australia, in July 2011, was published in August 2014. This represents quite an exercise in efficiency by the authors since the deliberations of the Vienna Congress in 2005 had still to be published at the time of issue of this report.

Report on botanical nomenclature—Melbourne 2011. XVIII International Botanical Congress, Melbourne: Nomenclature Section, 18–22 July 2011 by Christina Flann, Nicholas Turland & Anna M. Monro. *PhytoKeys* 41: 1–289 (29 Aug 2014) doi: 10.3897/phytokeys.41.8398: <http://phytokeys.pensoft.net/articles.php?id=4000>

New version and herbaria for the AVH

A new version of Australia's Virtual Herbarium (AVH) has been released and the collections of the Janet Cosh Herbarium (WOLL, University of Wollongong, Web ref. 1) and the La Trobe University Herbarium (LTB, Web ref. 2) are now added to the huge data set.

The new version comes with a new base map and a new spatial query tool and the filters on the left hand side have been reorganized. Try it for yourself at Web ref. 3.

Web ref. 1: <http://smah.uow.edu.au/biol/collections/UOW064887.html>

Web ref. 2: <http://www.latrobe.edu.au/ecology-environment-and-evolution/facilities/herbarium>

Web ref. 3: <http://avh.chah.org.au/index.php/2015/05/08/new-version-of-avh/>

New APNI/APC interface

On 27th February, Greg Whitbread's last day at work, the new user interfaces for Australian Plant Name Index (APNI) and the Australian Plant Census (APC) were released (Web ref.), representing a massive achievement by Greg and the project team.

The new interface and the format of the search results have some significant changes when compared with the old familiar screens. This is a change for both users and the APNI editing team and there may be some intermittent periods of downtime as changes are made. The new system is still in development and the project team are very responsive to feedback and suggestions. If you notice anything missing or looking strange in the interface you can use the "Provide Feedback" button and your feedback will be added to an issue tracking system and addressed as soon as possible. If you cannot see the button you can send an email and we will pass the information on. Any issues with the data (rather than the output) should be sent to cpbr-info@anbg.gov.au as usual.

The change in the URL for the APNI/APC search will have broken some existing links (e.g. RBG Sydney's *Plantnet*). If you are having a problem with other broken links please email IbisSupport@anbg.gov.au and give details of the URL being used and the IBIS team will get back to you.

The new interface is compatible with Firefox, Chrome, Safari, Opera, and Internet Explorer 9+. If you run into problems it's worth trying a different browser or version if possible, but please also let us know. The issue-tracking system logs your browser type and version when you provide feedback.

While there's still work to do we're excited about the new possibilities presented by this first release. We're happy to hear your thoughts in general or let us know if you experience any issues trying to use the new system and we'll do our best to help.

Web ref. <https://biodiversity.org.au/nsl/services/search>

Anna Monro
(on behalf of APNI editing and NSL project teams)

Citizen Science and geocoordinates

For those of you who do not belong to our sister society, the Society of Australian Systematic Biologists (SASB), their newsletter is also available on-line (Web ref. 1). The last issue contained an article on Australian Citizen Science in the form of an account of Bowerbird, a project set up by the Atlas of Living Australia. You can learn more about Bowerbird and what it is achieving through Ken Walker's article (access through the SASB Newsletter at Web ref. 2) or go directly to the site and see for yourself (Web ref. 3) the sort of collections which are being made and the information which is being contributed.

Bob Mesibov's second article on latitudes and longitudes is also included in this last issue (Web ref. 4).

Web ref. 1. www.sasb.org.au

Web ref. 2. www.sasb.org.au/banksia.html

Web ref. 3. www.bowerbird.org.au

Web ref. 4. http://www.sasb.org.au/banksia/Banksia_11_Feb_2015.pdf

Report from Senate inquiry into invasive species

A Senate inquiry was established in June 2014 to investigate:

the adequacy of arrangements to prevent the entry and establishment of invasive species likely to harm Australia's natural environment, including recent biosecurity performance and Australia's state of preparedness for new environmental incursions,

With deliberations completed, the report has been available (Web ref. 1) since May 2015¹.

While there were 26 recommendations in total, those listed here are probably most relevant to plant systematists.

- Inspector General of Biosecurity to be appointed and to review high-risk environmental biosecurity concerns, including gaps in pathway and risk analyses. (Rec. 1).
- Develop a national priority list of pests and diseases of environmental biosecurity concern not yet established in Australia. (Rec. 9)

- Update the 25-year-old northern Australia Quarantine strategy. (Rec. 10)
- Review processes for allocating funding under NRM programs to minimise delays for time-sensitive projects (Rec. 8).
- Establish a taxonomic identification service similar to that of the New Zealand Marine Invasive Taxonomic Service. (Rec. 14).
- Take legal action against internet retailers and sites that repeatedly breach plant and seed import requirements. (Rec. 15).
- Address the current decline in scientific expertise related to biosecurity (Rec. 12).
- Standardise protocols for labelling, weed identification and plant sales tracking across the industry and states (Rec. 18).
- More regular ship inspections targeted at bio-fouling. (Rec. 22 & 23).

The Invasive Species Council and the ABC were the only organisations to comment on the tabling of the report (Web ref. 2 & 3) and both covered the increased biosecurity risk to Australia if the present conditions prevail.

In the very same week, two days before the release of this report, the Senate passed its Biosecurity Bill 2014 (Web ref. 4), which seems ironic given that it covered much of the same ground.

Web references

1: www.aph.gov.au/Parliamentary_Business/Committees/Senate/Environment_and_Communications/biosecurity/Report

2: <http://invasives.org.au/media-releases/>

3: www.abc.net.au/news/2015-05-14/senate-inquiry-critical-of-biosecurity-management/6469134

4: www.agricultureminister.gov.au/pages/media-releases/historic-biosecurity-bill-2014-achieves-passage-through-senate.aspx

Australia's biosecurity expertise in decline

Another report to come out recently was one prepared by CSIRO together with Animal Health Australia, the Plant Biosecurity Cooperative Research Centre (CRC) and Invasive Animals CRC together with industry, government and other scientific organisations (Simpson & Srinivasan 2014). The twelve megashocks listed in *Australia's Biosecurity Future* as possible threats which might be faced in the next few years are sobering reading since even one of them could be disastrous and at a time when our scientific expertise has radically

¹ We thank John Hosking for drawing this to our attention. Eds

declined.

Of particular note (p. 44) is:

Another major concern for Australia is the loss of biosecurity-specific human resources. These declines are occurring broadly across the biosecurity landscape, reducing our overall pest and disease response capability. For example, there have been major declines in taxonomists (an important part of diagnostics), with estimates that 50 per cent of Australia's diagnostics capability will be lost by 2028.

In addition, many experienced staff in fields such as epidemiology and entomology are approaching retirement, with a lack of younger people available to take their place and meet immediate needs. A 2012 survey, commissioned by the Australasian Plant Pathology Society and the Australian Entomological Society, identified that the number of plant pathologists and entomologists in the over 55 age bracket had increased since 2006, alongside a decline in numbers in the under 35 age brackets. The study highlighted that to maintain the status quo, 50 per cent of current capacity in these areas will require replacement within 15 years (Howie 2012).

References

Howie B. (2012). *Plant Pathology and Entomology Capability Study 2012*. Australasian Plant Pathology Society (APPS) and the Australian Entomological Society (AES).

Simpson, M. & Srinivasan, V. (2014). *Australia's Biosecurity Future: preparing for future biological challenges*. (CSIRO, Canberra). Downloadable at <http://www.csiro.au/en/Research/Farming-food/Innovation-and-technology-for-the-future/Biosecurity-Future-Report>

Help with botanists' handwriting

Those of us who have had to identify a botanist's handwriting in the past are familiar with the series of papers published in *Candollea* by H.M. Burdet between 1972 and 1979. What you may not be aware of is that this information is now accessible through a searchable database on the Conservatoire er Jardin Botaniques ville de Geneve (G) web site (Web ref. 1).

But there are also other sources of help. For instance the Linnean Herbarium (S-LINN), at the Swedish Museum of Natural History (S), has a handwriting page identifying each of the handwritings of collectors who contributed to

the Linnean Herbarium (Web ref. 2).

And then there is *Chirographum historicum* (Web ref. 3), a collaborative effort between several American herbaria, which has a database searchable by collector. Their aim is to develop a freely available central resource for the dissemination of handwriting documentation and they invite collaborative submissions from other curators and historians desiring to document handwriting of botanical collectors.

For some tips on reading really old handwriting (before 1800) visit the *The National Archives, Palaeography* (Web ref. 4). There are tips on old handwriting scripts, sample images and lots of transcriptions for the sample images. Tutorials and practice pages are included, if you are so inclined.

Collections of handwriting in Australian herbaria do exist. Are there efforts to make them available on the web?

Web references

1: <http://www.ville-ge.ch/musinfo/bd/cjb/auxilium/>

2: <http://linnaeus.nrm.se/botany/fbo/hand/welcome.html.en>

3: <http://harvest.cals.ncsu.edu/chiro/>

4: <http://www.nationalarchives.gov.uk/palaeography/>

What's happening in New Zealand botany?

You can see some of what is happening in New Zealand botanical world through the newsletter of the Allan Herbarium in Christchurch, *The Plant Press* (Web ref. 1). In the March issue, number 9, it was reported that their Lucid identification keys are to be converted to LucidMobile apps, with the *Coprosma* key already successfully converted and able to be downloaded for free. Each issue also lists publications in which the staff have been involved and this one has, amongst others, a reference to and a link to Novis & Broady's defence of the placement of the cyanobacteria within algae (Novis & Broady 2014) as well as links to new treatments in the *Flora of New Zealand*.

The June issue, just released, reports on volunteer Elizabeth Ross's continuous 23 year service, Kerry Ford's two one month stints in Cambodia with the Ministry of Agriculture, Forestry & Fisheries for the Kingdom of Cambodia and a collaboration

between Landcare and DOC (Department of Conservation) in which David Glenn of Landcare is supporting and mentoring a young botanist in the identification and accessioning of non-vascular plants collected as a result of monitoring projects by DOC (a win-win situation to be emulated).

References

Novis P, & Broady P (2014). Reclaiming the term algae for the Cyanobacteria. *New Zealand Journal of Botany* 52(4): 446–448. <http://dx.doi.org/10.1080/0028825X.2014.976231>

Web ref. 1: <http://www.landcareresearch.co.nz/publications/newsletters/plantpress>

Global interaction on integrating digitised biocollections

iDigBio (Integrated Digitised Biocollections) is a group primarily emanating from the two Florida universities and their Museum of Natural History. Its goal, with NSF funding, is “making data and images of millions of biological specimens available on the web”. As a result of their meeting held in November 2014 plans were made for an international summit focusing on data sharing and strategies for leveraging common digitization practices and protocols. This event was hosted by the Atlas of Living Australia at CSIRO, Black Mountain, Canberra from the 13-17 April 2015.

Examples of the sort of talks presented are:

- Pam Soltis: Role in advancing scientific research with digitized data
- Gil Nelson, Austin Mast, and Pam Soltis: iDigBio - Education and outreach
- Greg Riccardi: iDigBio’s role in facilitating and enabling digitization
- Jose Fortes: Cyberinfrastructure, portal and data
- David Jennings: Project management
- Austin Mast: Onsite public engagement in digitization
- Gil Nelson: Community building, digitization workflow development, training and product workshops
- Paul Kimberly: Smithsonian Institution’s National Museum of Natural History: Rapid capture techniques
- Keping Ma: National Specimen Information Infrastructure of China (NSII)
- Vince Smith: NHM Digital Collections

Programme and the NHM Data Portal

- Paul Flemons: DigiVol: Taking crowdsourcing to the next level with structured volunteering
- Alexis Tindall & Alison Vaughan: Community coordination for Australian herbaria and zoological collections
- Dan Gledhill: Digital tools for taxonomy: maps, images, x-rays and the ALA
- Changming Sun: Feature extraction from insect wings (dragonfly example)
- Stuart Anderson: Putting 3D Insect Scans to Work.

This information has been extracted from an account of the meeting (Web ref. 1).

Web ref. 1: <https://www.idigbio.org/content/digitization-biological-collections-global-focus>

“The endangered dead”

An article in the February 19th issue of *Nature* entitled “The endangered dead” was another in the number pointing out the value of specimens in natural history museums as a source of new species and new information.

But just as the collections are growing more valuable, they are falling into decline. With many institutions struggling to cope with significant budget cuts, some collections are being neglected, damaged or lost altogether. And the scientists who study them are also threatened as their positions disappear.

More successful institutions are able to survive by focusing on molecular techniques or by shifting their emphasis to education or entertainment. Some collections have been warehoused, making it difficult to access them, while others hang on in antiquated conditions making them susceptible to disasters such as floods, fires and earthquakes. And in the meantime restructures due to cost cutting are leading to the replacement of several specialist researchers or curators with a single collections manager ranging broadly across a number of fields.

The complete article by Christopher Kemp (2015) can be accessed on the web.

Reference

Kemp. C (Feb. 19th 2015). The endangered dead. *Nature* 518: 292-294. <http://www.nature.com/news/museums-the-endangered-dead-1.16942>

What's happening in Sydney?

Talking about disappearing scientists, it was alarming to read of further cuts at Sydney's Botanic Gardens in their recent state budget (Anna Patty, *Sydney Morning Herald* 26th June 2015). The cuts include the loss of 16 full-time positions by the end of the 2015–16 financial year and the loss of \$1.5 million in recurrent funding. There has apparently been a loss of 60 positions (one in five) since the Baird government came to power and with this further round there will almost certainly be consequences for the Herbarium and its functioning.

In the same article there was also reference to the Glass Pyramid in the Botanic Gardens, apparently already dismantled to make way for the grand future plans for the Gardens. These future plans, which have created quite a lot of controversy, for example in the *GardenDrum*, (Web ref. 1) and from Paul Keating (*Sydney Morning Herald*, Web ref. 2), can be accessed through the Gardens web site (Web ref. 3) and consist of The Calyx, a 200th anniversary project and the draft 25 year Master Plan itself (no longer accessible), which includes a hotel, new café and toilets, a new visitor centre and apparently the shifting of the Herbarium, perhaps to Mt Annan, although this is not clear, while the library remains in Sydney.

References

Patty A. (2015) Sixteen staff lost in NSW budget cuts to Botanic Gardens funding *Sydney Morning Herald*, June 26th 2015. <http://www.smh.com.au/nsw/sixteen-staff-lost-in-nsw-budget-cuts-to-botanic-gardens-funding-20150626-ghyjyd.html>

Web ref. 1: <http://gardendrum.com/2014/05/14/sydney-botanic-gardens-draft-plan/>

Web ref. 2: <http://www.smh.com.au/comment/royal-botanic-gardens-masterplan-a-vision-not-so-splendid-20140409-zqsbk.html>

Web ref. 3: https://www.rbgsyd.nsw.gov.au/welcome/quick_links/major_projects

And in Canberra?

On June 25th 2015 the Australian National Botanic Garden also launched a new 25 year master plan (Web refs 1, 2) which will see some major changes there as well.

- A new National Seed Bank to help conserve native flora
- a Conservatory to display tropical plants from northern Australia and the associated

Islands

- a new Visitor Centre and Cafe
- Children's Nature Play Terrace
- Ecotourism activities in the bushland precinct.

Just what this means for the cryptogam herbarium and reference herbarium is not clear but we will try and find someone to report in the next issue of the Newsletter.

Web references

1: <https://www.anbg.gov.au/gardens/about/management/master-plan.html>

2: <http://www.abc.net.au/news/2015-06-25/national-botanic-gardens-launches-plan-to-win-back-visitors/6573324>

Asian Acacia

Good to see that Bruce Maslin is still alive and kicking. He has just published an overview of *Acacia* in East and South-east Asia following work in herbaria in Singapore, Malaysia, Thailand and Vietnam.

Reference

Maslin, B.R. (2015). Synoptic overview of *Acacia* sensu lato (Leguminosae: Mimosoideae) in East and Southeast Asia. *Gardens' Bulletin Singapore* 67(1): 231–250.

Margaret Flockton Awards for 2015

The annual Margaret Flockton Award for botanical illustration, run by the Royal Botanic Gardens and Domain Trust, Sydney, has been won by Edmundo Saavedra Vidal, a scientific illustrator at the Instituto de Ecologia AC in Mexico. Vidal's winning entry of *Syngonium podophyllum* used ink and some graphite as supporting tone. He was also awarded a 'Highly Commended' for his genus *Thompsonella*. Sharing second prize was Klei Sousa from Brazil, who won the award in 2012; he also received a 'Highly Commended' for a second entry. Pauline Dewar of Victoria shared second prize; she has had 'Highly Commended' awards in the previous two exhibitions.

Entries were received from Australia, New Zealand, Spain, Brazil, Mexico, the United Kingdom, Germany and Poland. The winning entries can be seen on the web site (Web. ref.), from which this information has been taken.

Web ref.: https://www.rbgsyd.nsw.gov.au/education/art_and_illustration/Margaret_Flockton_Award_2015_exhibition

ABRS report

Staff updates

Director Mike Preece retired in December 2014 and has been replaced by Joanne Nathan (who before coming to ABRS, worked in the Department of the Environment for many years on natural resource management, water reform and biosecurity policy and regulation). Other recent retirements include Greg Whitbread (biodiversity informatics team), Pam Beesley (fauna team) and Helen Thompson (flora team) (see p. 42). Anne Fuchs (biodiversity informatics team) is assisting with Greg's projects including the *Flora of Australia Online* (see below). I have replaced Helen as the new editor of the *Flora of Australia*, which will be overseen by Pat McCarthy. Preparations are in place to re-fill Pam's position.

Flora of Australia

The *Flora of Australia* volume 37 - Asteraceae 1 was published earlier this year. This book covers all the Australian Asteraceae except for the tribes Gnaphalieae and Astereae, which were intended for volumes 38A and B, respectively. With the move to an online platform, no further volumes will be published in hard copy.

Non-vascular groups

FunKey: An interactive guide to the macrofungi of Australia. Key to Agarics, by Tom May, Kevin Thiele, Christopher Dunk & Simon Lewis, has been co-published by ABRS and RBG Melbourne. Based on the the latest web-integrated Lucid™ Player, *FunKey* provides an easy-to-use interface, with comprehensive fact-sheets for each genus, detailed information on the interpretation of all characters, and numerous drawings and photographs of macroscopic and microscopic features. It is available on a USB from Lucid Central (Web ref. 1) and as a mobile app.

Algae of Australia: Marine Benthic Algae of North-western Australia, 1. Green and Brown Algae, by John Huisman, was published in May 2015. This authoritative floristic account of 68 genera and 171 species will be followed in early 2016 by the eighth volume in the series documenting the far more speciose red algae of the North-west, including numerous taxonomic novelties.

Other achievements include our online *Checklist of the Lichens of Australia and its Island Territories*, which now has links to more than 2200 species descriptions and a similar number of illustrations (see Web ref. 2). Meanwhile, *Australian Mosses Online* gained enormously from the addition of Rod Seppelt's richly illustrated account of the family Fissidentaceae, including *Fissidens*, the largest Australian genus. AMO now provides descriptions, keys, maps and illustrations for almost 75% of the Australian taxa (Web ref. 3).

Flora of Australia Online

The Atlas of Living Australia (ALA) is working with the Australian and New Zealand botanical communities to develop an Australasian eFlora platform for plants, fungi and algae. This will provide an IT platform for collaborative editing and delivery of *Flora of Australia Online*, along with state electronic flora content. A platform prototype has been developed and to enable review of appropriate content and functionality for creating, editing, attributing and delivering content through the eFlora platform.

Further discussion about the development of the eFlora platform continues through HISCOM meetings and an eFlora Working Group, which operates as a reference group for the project. Ad-hoc expert working groups have also been established to enable focused discussion about topics such as managing authorship and attributions in dynamic online publications.

We envisage that published volumes of the *Flora of Australia*, excluding Volume 37, will be made publicly available through the eFlora platform. Volume 37 will not be made available online for 12 months following publication, as agreed with CSIRO Publishing. We will continue to review and edit unpublished manuscripts for publication in the *Flora of Australia Online*.

Grants

On 21st April 2015, the Parliamentary Secretary launched successful grants under the National Taxonomy Research Grant Program (NTRGP). More information about the grants is available online (Web ref. 4). [See next item].

Bush Blitz

Recent expeditions: February 2015: The Tarkine blitz, in Tasmania, saw the team, along with 14 botanists and zoologists, base themselves at Corinna Wilderness Lodge for 11 days, surveying sites such as Arthur Pieman Conservation Area, Savage River National Park and Reserve and Pieman River Reserve.

Upcoming expeditions include: Judbarra/Gregory National Park in the Northern Territory in late May to early June; Olkola National Park in Cape York, Queensland in July; Kiwirrkurra in the Gibson Desert in Western Australia, in

September; and Oxley Wild Rivers National Park in New South Wales in November.

Web references

1. http://shop.lucidcentral.org/index.php?route=product/product&path=60&product_id=69
2. <http://www.anbg.gov.au/abrs/lichenlist/introduction.html>
3. http://www.anbg.gov.au/abrs/Mosses_online/index.html
4. <http://www.environment.gov.au/node/36259>

Zoe Knapp and Pat McCarthy
May 2015

ABRS flora project grants awarded for 2015–16

Successful applicants in the latest round of ABRs funding for flora projects (Web ref. 1) were as follows.

Research grants

- Ashley Field and a team from James Cook University, Qld, for a three year project titled *Next-generation tassel-fern systematics: species delimitation in the Phlegmariurus phlegmaria complex (Lycopodiaceae)*; see Web ref. 2 for some further detail
- Marco Duretto (NSW), with funding for a three year project titled *The Australian Spermaceae (Rubiaceae: Rubioideae): systematics, evolution and historical biogeography*. The study will be led by Kerry Gibbons; see Web ref. 3.
- Trevor Wilson (NSW) with funding for a three year project titled *Systematics of Australian Plectranthus (Lamiaceae): application of molecular data to assess relationships and resolve interspecific ambiguities*; see Web ref. 3.

Non-salaried researcher capacity building grant

- Tony Orchard, Canberra, for a one year project *Compilation and publication of the correspondence of the botanist Allan Cunningham*.

Honours Scholarship

- Xenia Weber, Australian National University, Canberra, for a one year project *Identifying and describing new species in the southern bull-kelp genus Durvillaea*; see Web ref. 4 for some further detail.

Web references

1. <http://www.environment.gov.au/node/36259>
2. http://www.jcu.edu.au/pkg_auto/research/recentgrants.html
3. http://www.rbg Syd.nsw.gov.au/welcome/feature_stories/new_postdocs
4. <https://researchers.anu.edu.au/researchers/fraser-c>

Journal of the Adelaide Botanic Gardens

FREE JOURNAL BACK ISSUES AVAILABLE

The State Herbarium of South Australia is reducing its stock of early issues of the *Journal of the Adelaide Botanic Gardens*, Vol. 1 (1976) to 20 (2002).

Back-issues are free. Only postage & handling costs need to be paid.

Please check the journal's web-site (flora.sa.gov.au/jabg) for a listing of contents. Note that the number of parts per volume varies.

Email Jürgen Kellermann (juergen.kellermann@sa.gov.au) for further information.

If you still like to read and keep paper copies of the Journal, or if your institutional library is missing some parts, now is the time to order them!

Obituary

More than a portrait painter to the birds William T. Cooper (1934–2015)

John Clarkson

Queensland Parks and Wildlife Service, Mareeba

The internationally acclaimed wildlife artist William T. Cooper, known to his friends as Bill, died at his home at Topaz near Malanda on the Atherton Tablelands in Far North Queensland on Sunday 10th May aged 81. In a career that spanned over 50 years, Bill established himself, in the words of Sir David Attenborough, as “Australia’s greatest living scientific painter of birds” and “possibly the best in the world”.

of Australia. Beginning his painting career as a landscape and seascape artist, he made his first serious attempt at professional bird painting in the mid 1960s. He published his first book, *A Portfolio of Australian Birds*, with Keith Hindwood in 1968. This was followed by a series of commissions and invitations to illustrate two collections of short stories by H.D. Williamson. In the late 1960s, on the recommendation of Keith Hindwood, a young

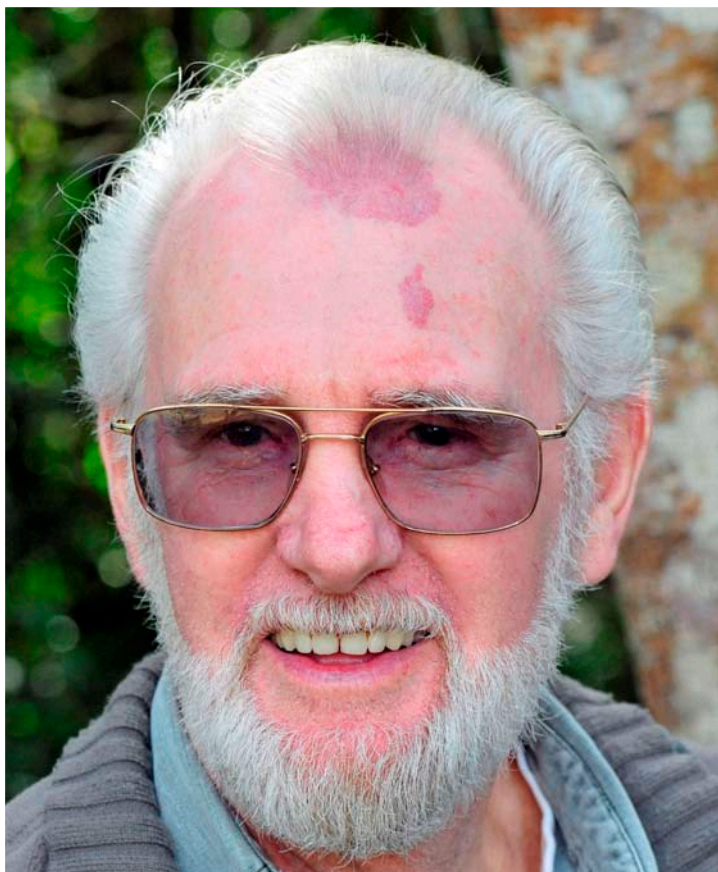


Fig. 1. William T. Cooper

Born in Newcastle, New South Wales, in 1934, Bill was captivated by birds at an early age. As a 10 year old, he would visit the Pope Library in Newcastle while his mother went shopping and pore over John Gould’s 7-volume *Birds*

ornithologist, Joe Forshaw, sought out Cooper at an exhibition of paintings in Canberra. Out of that meeting grew a lifelong collaboration that saw the production 6 monographs, totalling eleven volumes, and two beautiful portfolios

with Forshaw providing the text and Cooper the illustrations. The first of these was *Parrots of the World* published in 1973, followed by *Birds of Paradise and Bower Birds* (1977), *Australian Parrots* (1980), *Kingfishers and related birds* in six volumes (1983–1994), *Cockatoos* (2001), *Turacos* (2002) and culminating in the *Pigeons and Doves in Australia* published in 2015.

In 1992, the Academy of Natural Sciences in Philadelphia, Pennsylvania, presented Cooper with their gold medal for:

artistic endeavours and life's work which have contributed to mankind's better understanding and appreciation of living things.

He was the first Australian recipient in its 190-year history. In 1994, he was made an Officer of the Order of Australia (AO) in recognition of his service to art and to ornithology as a natural history artist. He remains one of very few visual artists to receive such a high Australian honour and the only natural history artist to do so. His contribution to the arts was recognised again in 2000 when the Wet Tropics Management Authority presented him with a Cassowary Award, an award established in 1999 to recognise individuals and groups who have made outstanding contributions towards the conservation and presentation of the Wet Tropics World Heritage Area. His great contribution to natural history painting was again recognised just months before his death when he was awarded an Honorary Doctorate in Science from the Australian National University in December 2014.

In 1993, Sir David Attenborough produced a documentary about birds of paradise and the art of bird illustration entitled *Portrait Painter to the Birds* (Web ref. 1). The documentary, filmed by the ABC Natural History Unit, examined the tradition of great bird painting and followed Bill as he painted Victoria's Riflebird, a Wet Tropics endemic. Twenty years later, North Queensland film maker, Sarah Scragg, spent 2 years filming Bill at work, in the field and in his studio, as he created 30 exquisite works of art for what was his last exhibition held in the Morpeth Gallery near his home town of Newcastle in October 2013 (Web ref. 2). A biography, *An Eye for Nature: The Life and Art of William T. Cooper*, written by Penny Olsen, was published by The National Library of Australia last year (Olsen, 2014).

With the great and well-deserved focus on his contribution to ornithology, it would be easy to overlook the fact that Bill was also a highly talented botanical illustrator. One thing that set him apart from many other bird painters was the great attention he paid to getting the background just right. If you find yourself in a book shop soon, search out *Pigeons and Doves in Australia* and look at the illustrations with a botanical eye (Fig. 2). If for a moment you can avert your eyes from the birds, you can't fail to appreciate the meticulous care taken to ensure the botanical accuracy of every branch, leaf, flower or fruit. Remove the feathered creature and anyone who appreciates great botanical art would still have a splendid picture. From time to time, Bill ventured into painting plants alone. The earliest one I have seen is a small oil painting of *Actinotus helianthi* produced in the late 1970s that hangs in the lounge room of his house at Topaz. This was reproduced in Penny Olsen's biography of Bill (Olsen, 2014). Helen Hewson included him amongst botanical artists discussed in her book, *300 Years of Botanical Illustration in Australia* (Hewson, 1999). In 1992 he produced a series of vignettes, including many plants, for a book, *Visions of a Rainforest*, authored by Stan Breeden, that described a year in the rainforest of the Atherton Tablelands (Breeden, 1992). Older members who attended the ASBS conference held in Kuranda in 1994 might remember the exhibition of botanical art. Among the works exhibited there were two original watercolours by Bill, one a beautiful *Alloxylon flammeum* (Fig. 3), the other *Dillenia alata*. Reproductions of these had been used to illustrate the covers of volumes 1 and 2 of the books to accompany the electronic key to Australian tropical rainforest trees (Hyland *et al.* 1993). The next edition of the key (Hyland *et al.*, 1999) also featured a reproduction of a Cooper painting of *Gardenia scabrella* on the cover.

In 1994, the work, for which Bill is perhaps best known to many botanists appeared. *Fruits of the Rain Forest*, written by Bill's wife Wendy (Cooper 1994), was lavishly illustrated with 626 life-sized colour illustrations of rainforest fruits in exquisite detail. A decade later, after extensive collecting in rainforests and mangroves from the Torres Straits to Rockhampton, *Fruits of the Australian Tropical*



Fig. 2. Superb Fruit-Dove (from *Pigeons and Doves in Australia*) with *Cissus hypoglauca*.

Published with permission of Cooper family.

Rainforest appeared (Cooper, 2004) almost doubling the number of fruits illustrated to 1,230. With the text covering 2,440 species, it was, and still is, the go-to book for identification of tropical rainforest plants. In a foreword to the book, David Mabberley described the drawings of the fruits as “a superb synthesis of scientific accuracy and aesthetic sensitivity” and recalls John Corner’s comments when shown a copy of the 1994 edition that it was “a masterpiece of art and scientific accuracy”. High praise indeed from two great botanists. A cut-down field guide, reviewed in this Newsletter (Clarkson 2013), was published in 2013. Had it not been for those days spent in the Pope Library all those years ago maybe botany would have had its own portrait painter to the plants.

Bill is survived by his wife Wendy and a son, Darryl, by a previous marriage. He was a neighbour and a friend and he will be sorely missed.

Eponomy

Cupaniopsis cooperorum P.I Forst.
(Sapindaceae). Forster, P.I. (2002).
Austrobaileya 6:267.

Stegantherum cooperorum Whiffin.
(Monimiaceae). Whiffin, T. (2007). *Flora of Australia* 2:453.

Both species were named jointly for Bill and his wife Wendy recognising, as Penny Olsen (2014) points out,

one of those rare collaborations in which professional and personal life blend and both partners contribute and grow.

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(in chronological order).

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Fig. 3. *Alloxylon flammeum*

Published with permission of Cooper family.

Australian Bush. Reed: Sydney.

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Awards

- 1992 Gold Medal Academy of Natural Sciences (USA)
- 1994 Order of Australia (AO)
- 2000 Cassowary Award, Wet Tropics Management
- 2014 Honorary Doctorate in Science, Australian National University

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Retirements

Dave Mallinson retires

David Mallinson (Dave) worked as a horticulturist at the Australian National Botanic Gardens (ANBG), Canberra, from 1985 to 2001. From his duties there, and recreational activities, he developed an exceptional ability in plant identification. He transferred to the Australian National Herbarium (ANH) in 2001 where he undertook specimen curation for the AVH (Australia's Virtual Herbarium) project and continued as a curator for many plant families/orders, including Asteraceae and Scrophulariales. From about 2006, he assumed responsibility for identification of specimens submitted by the public via the ANBG Plant Identification

Service (the 'Public IDs'). Dave assisted with the online *Census of the Vascular Plants, Hornworts, Liverworts and Slime Moulds of the Australian Capital Territory* (see Web ref.), was a major contributing author to the much-utilised *Grassland Flora: A field guide for the Southern Tablelands (NSW & ACT)* (1998) and has recently worked on a corresponding woodland flora volume, which is in production. He retired from ANH on 17th Dec 2014, and his botanical expertise, practical field-work skills and sense of humour are greatly missed.

Web ref. <http://www.anbg.gov.au/cpbr/ACT-census-2012/index.html>

Maggie Nightingale

A Canberra farewell

¹This is very sad day for me, on both personal and professional levels. Greg, Helen and Pam have been part of my entire life at the ANBG. And part of the lives of almost everyone here.

This is probably going to sound like an obituary. And in a way it is. Not in the sense, “you are dead to us now”, but in the sense of a passing of an era, of impending shared loss.

Greg and Helen especially have been the glue, and the symbol, of the link between the Gardens and ABRS, starting with the original work moving APNI and CAVP into a database, then publishing them as four volumes of old school book, and finishing with the *Flora of Australia On-line* and the *National Species List*.

But we are getting ahead of ourselves.

Greg came to the Gardens from CSIRO Plant Industry, where he was a technical officer in the Herbarium. He had, at the time, a unique combination of skills – he knew how to spell herbarium and he could spell computer and Unix. That met the selection criteria.

We went head-hunting him for the Gardens soon to be established database. At the time our herbarium labels were being typed on a stand-alone word processor. We had to do better.

And so the fun began. There were no rules. So we made them up. No-one said we couldn't do anything so we just did it. There were no collections databases, so he made one. There was no network, so on weekends we crawled through ceiling cavities dragging cables. There were no data standards, so we made them up. There was no internet, so we built a website.

And people all over the world copied us. It really was fun. You should have been there.

We built a team around collections, botanical information, and technology. And what a team it was. If you plotted them on the Myers Briggs

¹ This little-edited note seemed well worth publishing in the form provided. Jim was unable to deliver his thoughts at the farewell of Greg Whitbread (biodiversity informatics team), Pam Beesley (fauna team) and Helen Thompson (flora team).. So it was read by Murray Fagg. We've referred to Helen's retirement in recent issues in relation to her contributions to ASBS over the years. Greg has also made a major contribution in the establishment and efficient running of the Society's web pages.

Eds.

personality spectrum, you could not have got them further apart if you tried. And we argued. We shouted at each other. We swore at each other. We threw things at each other during meetings. We managed to evacuate the cafe with one of our arguments.

I'm going to really miss that. It was truly a crucible of creativity.

Greg's legacy to the Gardens, and to ABRS, and to the national and international biodiversity communities has been enormous.

Here is a short and partial list of what he has driven or contributed to in a big way:

- in his previous life, collection of a number of type specimens;
- design and building of the herbarium database;
- integration of Living Collections database;
- integration of ANBG and CSIRO herbarium databases;
- integration of Photo database;
- APNI, APC;
- the International Plant Names Index;
- Flora of Australia Online;
- IBIS;
- HISPID data standards;
- international data standards;
- international data management applications;
- the direction of TDWG;
- vision of free, open shared data;
- the world's first live database to internet gateway;
- the world's first botanical and second biodiversity web server;
- the shared vision for Australia's Virtual Herbarium, which was
- the inspiration for GBIF and the ALA;
- the National Species List.

The important aspect of all this was that Greg saw no distinction between a herbarium and gardens as a collection of plants and the herbarium and gardens as an information resource. As a result we regard the database not as something separate, but as an integral part of the collections.

This, and the vision of free open shared data, is Greg's real legacy.

The future

Greg is really going to leave a huge hole in the ANBG. He has a suite of skills usually covered by at least four people. But we only get to



Fig. Helen Thompson, Greg Whitbread and Pam Beesley at their retirement celebration.

replace him with one. It is going to be a real challenge. [So] be gentle with Anne [Fuchs] and John [Hook].

These are fiscally challenging times. Whenever someone leaves, there is a temptation to rid the remains. Anticipating this we has prepared special signs that will be appearing all over the gardens: KEEP OFF THE ANBG IBIS. On the back is an explanation of the ways IBIS underpins everything we do.

We have no intention of allowing the IBIS equivalent of the Monty Python ‘Dead Parrot’

sketch. Luckily Greg has offered to return as a volunteer – to keep Murray company. Shades of the Blues Brothers and “We are getting the band back together”. This will enable Greg to continue his intellectual input to the National Species list and to botanical information management generally. All the best for the future, Greg. What you have created here will be remembered, used and enhanced by generations of botanists and bioinformaticians to come.

Jim Croft

New books

New *Flora of Australia* volume

**Flora of Australia Volume 37
Asteraceae 1**
*Flora of Australia Series Australian
Biological Resources Study/CSIRO
Publishing, Feb. 2015. 664 pages, 250
x 176 mm, 250 x 176 mm*
**ISBN: 9781486304158 - AU \$170.00
(hardbound); ISBN: 9781486304165 -
AU \$130.00 (paperbound)**

The first of the three volumes which will cover the Asteraceae or Compositae was published in February 2015. The volume contains an introduction to the family in Australia and includes a synoptic classification and

keys. There are treatments of all the tribes represented in Australia except Gnaphalieae and Astereae which will be the subjects of the other two volumes.

Asteraceae are one of the largest families in Australia, with an estimated 290 genera and 1430 species. Nineteen tribes, 233 genera and 518 species are treated in this volume, the majority of them introduced. Twenty-seven authors, illustrators and photographers contributed to the volume, but major contributors of generic treatments include Tony Orchard, Ian Thompson, Tony Bean and Abdul Ghafoor and the whole volume was edited by Annette Wilson.

Brown's Scientific Words now on-line

For those of you who do not have access to a copy of Roland Wilbur Brown's *Composition of Scientific Words*, invaluable when deriving names for new taxa, it is now available on-line (Web ref.). First published in 1927 under the title *Materials for word-study*, it was reprinted in 1954. The name was changed to its present one in 1956 when it was also revised. It was reprinted in 1978 and 1985 but has not been reproduced since that time.

**Published by the Smithsonian
Institution Press, Washington, D.C.
ISBN 0-87474-286-2.**

Web ref.: https://archive.org/stream/compositionofsci00brow/compositionofsci00brow_djvu.txt

New book on Georgiana Molloy

**Georgiana Molloy: the mind that shines.
By Bernice Barry
Redgate Consultants, March 2015
416 pp; ISBN: 9780994206404; \$35.
Purchase through Cypress Book Agency,
38 Harvest Road, North Fremantle WA
6159 (ph. 0417 916 180 or
email: margaret.cypress@amnet.net.au)
or on-line at: <http://www.chartandmapshop.com.au/2808432/Georgiana-Molloy-The-Mind-That-Shines/9780994206404>**

You can read more about the book and the author on the blog site (Web ref. 1), where there is further information on Georgiana that did not make it into the book. No reviews have been found although there has apparently been one in the *Weekend West* of the *West Australian* newspaper and it was the May book of the month in the Kings Park Gallery Shop. The book is available in Australia through the or through the website above.

Web. ref. 1: <http://georgianamolloy.com/>

Shifting roles of museum exhibitions

**Life on display: Revolutionizing U.S.
museums of science and natural
history in the twentieth century.
By Rader, K.A. & Cain, V.E.M.
The University of Chicago Press, 2014
456 pp., ISBN 9780226079660 HB,
\$US45.**

Also noticed on the University of Chicago Press site was this title which:

uses the history of biological exhibitions to analyse museum's shifting roles in twentieth-century American science and society... profound changes in these exhibitions – and the institutions that housed them – between 1910 and 1990, ultimately offer new perspectives on the history of museums, science and science education.

Reviews and the contents of the book can be seen on the web.

Web ref. <http://press.uchicago.edu/ucp/books/book/chicago/L/bo18692187.html>

Duyker on D'Urville

**Dumont D'Urville: Explorer and Polymath, by Edward Duyker.
Published by Otago University Press
Sep. 2014
664 pp.; 170 x 245 mm. Price: \$70.
ISBN: 9781877578700
http://www.otago.ac.nz/press/booksauthors/2014/dumont_durville.html**

Edward Duyker has already provided the general public, and systematists in particular, with essential, thoroughly-researched works on scientist-explorers such as Daniel Solander, Bruny d'Entrecasteaux, Jacques Labillardière and Francois Péron. The latest subject to be scrutinised by him is yet another admirable French explorer, Dumont D'Urville (1790–1842), about whom we had previously known little. On the web there are published reviews of the book (Web refs 1, 2), you can hear Duyker talking about d'Urville (Web ref. 3), and you can find an account of d'Urville's collecting activities in New Zealand (Web ref. 4).

The genus *Durvillea*, which includes the large bull kelps of southern New Zealand, is named for him. In Australia there are some 60 plant names with d'Urville as the collector of the type (APNI search) and about 26 taxa which bear his name as an epithet. Most of his collections are in Paris (P): a total of 1119 collections from all parts of the world were listed in a search of the Sonnerat database (Web ref. 5), including a specimen of Apple of Sodom (*Solanum linneanum*) from Port Jackson in 1823.

Web references

1: www.smh.com.au/entertainment/books/book-review--dumont-durville-explorer-and-polymath-20141110-11b2ao.html#ixzz3cXL9CW4B

- 2: www.theaustralian.com.au/arts/review/explorer-dumont-durville-laid-bare-in-biography-by-edward-duyker/story-fn9n8gph-1227383205790
- 3: www.abc.net.au/radionational/programs/ockhamsrazor/dumont-d27urville---french-explorer/5947346
- 4: <http://nzetc.victoria.ac.nz/tm/scholarly/tei-OliVisi-t1-body-d1-d1-d5.html>
- 5: <https://science.mnhn.fr/institution/mnhn/collection/p/item/search/form>

IBC orchid papers published

Darwin's Orchids, Then and Now.
Retha Edens-Meier and Peter Bernhardt (eds).

The University of Chicago Press,
published 5th November 2014. 384 pp.
ISBN: 9780226044910 (hardback);
ISBN: 9780226173641 (ebook).
RRP \$96.

The book is a result of sessions on orchids held in honour of Darwin at the International

Botanical Congress in Melbourne in 2011. The format is based on Darwin's 1862 publication of "On the Various Contrivances by Which British and Foreign Orchids Are Fertilised by Insects and on the Good Effects of Intercrossing, or Fertilisation of Orchids".

Amongst others, the book contains an important paper by Peter Weston, Andrew Perkins, James Indsto and Mark Clements on the "Phylogeny of Orchidaceae Tribe Diurideae and Its Implications for the Evolution of Pollination Systems" (Peter has a summary of that paper at Web ref. 1).

The contents of the book can be seen on the publisher's webpage (Web. ref. 2).

Web references

- 1: https://www.rbg Syd.nsw.gov.au/science/Plant_Diversity_Research/Orchidaceae_tribe_Diurideae
- 2: <http://www.press.uchicago.edu/ucp/books/book/chicago/D/bo18659332.html>

Robyn Barker

Book reviews

A beautiful and well-designed botanical field guide for the ACT

Review by Alexander N. Schmidt-Lebuhn
CSIRO, Australian National Herbarium, Canberra

Photographic Guide to Native Plants of the Australian Capital Territory.

By Meredith Cosgrove.

Meadow Argus, Canberra, 2014.

360 pp. ISBN: 978-0994183408.

AUD \$45.00 (paperback).

<http://meadow-argus.com>

Although they cannot, of course, replace floras and monographs in my work, I love floristic picture guides, even of regions I have never visited. Thanks to some generous colleagues, I consequently have at home a guide to the South African fynbos and another to the steppe flora of Kazakhstan which I cannot even read (except for the Latin names). It is therefore perhaps unsurprising that the first book I bought when I came to Australia a few years ago was a field guide to the plants of the ACT.

Over the past few years it has been of some help when I was in a nature reserve and wanted to figure out what plant was flowering in front of me, but it has also remained a

source of frustration. The layout is somewhat amateurish; in some cases, the taxonomy was horribly outdated even on publication; the order of the species is illogical, making it hard to find what one was looking for; information provided is minimal; and, perhaps worst in a guide that relies nearly entirely on visual comparison, quite a few pictures are inadequate in that they fail to show differentiating characters, and some of them are of rather poor quality anyway.

Now, however, there is an alternative. Meredith Cosgrove's recently published *Photographic Guide to Native Plants of the Australian Capital Territory* gets all this right – and more.

Every species occupies a whole page, two in the case of eucalypts. Two thirds of the space is taken up by photographs, while the remaining third on the right is reserved for descriptions and notes. Information provided in this column includes habit, height,

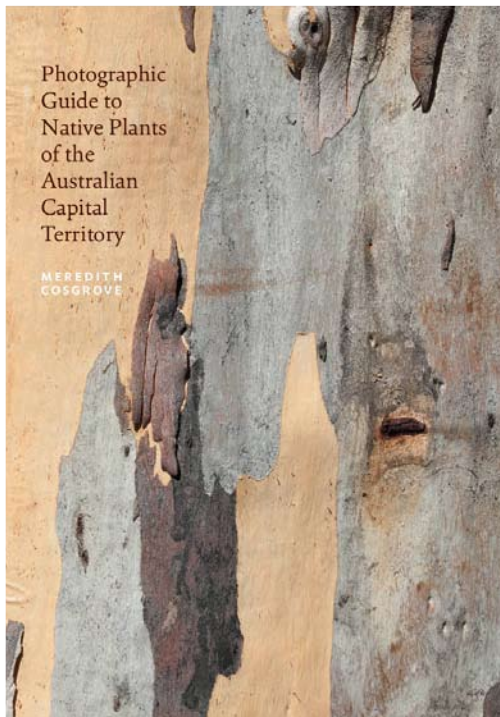
flowering and fruiting time, flower colour, fruit type, breeding system, key identification characters, preferred habitat and elevation, and where relevant notes on variation, synonymy and related species in the ACT. In the right lower corner the reader will find, again for every species, a density plot indicating the occurrence of the plant along the elevational gradient and a little map of the ACT with red dots indicating databased collection localities. Finally, at the bottom of every page are four size characters, usually leaf length, leaf width, flower size and fruit size, with minimum and maximum values expressed at a 1:1 scale as dark (min) and dark plus light (max) coloured bars. This clever arrangement allows the user in the field to simply hold the relevant plant organ onto the page to check if it falls into the range of the species, without having to carry a ruler around.

Perhaps the greatest strength of the book are its pictures. All taken by the author herself, they are of admirable quality. Perhaps even more importantly, whereas most other field guides are content to show only an inflorescence, Meredith Cosgrove has taken pains to present all relevant organs and phenological stages. Thus the average herb will feature pictures of overall habit, flowers, fruits and leaves, while a eucalypt will generally be showcased with fruits, buds, juvenile stage and mature stage leaves, and at least one picture of the bark. Perhaps nothing demonstrates the care that went into designing this book better than the fact that the illustrations for the species of *Lomandra* include pictures of the leaf apices – crucial characters for identification that are nonetheless rarely depicted in other works. The author has the botanical expertise to know what the reader needs to see for secure identification

and made sure that they will be able to see it.

Perhaps unsurprisingly, however, the field guide does not cover the entire ACT flora. It restricts itself to seed plants, and among the monocots it excludes the grass-like families, a decision that will disappoint those who are passionate about grasses, sedges and rushes. (Perhaps a separate publication dealing with ferns and grasses at the same level of detail might be considered a suggestion for future research to be taken up by the community.) For some species-rich groups such as orchids or eucalypts, the book provides a table of all species and hybrids in the ACT, indicating in bold the ones that are treated.

While I personally like that the plants are ordered alphabetically by their family, allowing me to easily locate individual taxonomic groups, some end-users may have preferred if the species were grouped after flower colour or some other easily recognisable character. On the other hand, the beginning of the book provides an intuitive tabular key to families by colour and petal number that makes such an arrangement unnecessary. The book is also designed to find a compromise between



avoiding the use of specialist terminology and providing accurate information, e.g. by treating the ray florets of the Asteraceae as “petals” in the tabular key but explaining the true nature of the capitular inflorescence in a nearby diagram. Consequently, the interested lay user should find it easy to locate the plant they are interested in.

Despite comprising 360 pages and covering around 300 species, the field guide is a compact A5 format and only 2 cm thick, and will thus easily fit into the average bush walker's backpack. Self-published at a price of \$45, it is not only affordable but exceedingly good value.

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ASBS publications

Australasian Systematic Botany Society Newsletter

Back issues

Back issues of the Newsletter are available from Number 27 (May 1981) onwards, excluding Numbers 29, 31, 60, 84–86, 89–91, 99, 100, 103, 137–139, and 144. Here is the chance to complete your set.

Australian Systematic Botany Society Newsletter No. 53

Systematic Status of Large Flowering Plant Genera

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*.

Cost: Free for all newsletters except Number 53 (postage may be charged)

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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

For all those people interested in the 1988 ASBS symposium in Melbourne, here are the proceedings. It is a well presented volume, containing 36 papers on: the botanical exploration of our region; the role of horticulturalists, collectors and artists in the early documentation of the flora; the renowned (Mueller, Cunningham), and those whose contribution is sometimes overlooked (Buchanan, Wilhelmi).

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

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AUSTRALASIAN SYSTEMATIC BOTANY SOCIETY INCORPORATED

The Society

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

Membership

Membership is open to all those interested in plant systematics. Membership entitles the member to attend general meetings 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, and forwarding it, with the appropriate subscription, to the Treasurer. Subscriptions become due on 1 January each year.

The ASBS annual membership subscription is AU\$45; full-time students \$25. Payment may be by credit card or by cheques made out to Australasian Systematic Botany Society Inc., and remitted to the Assistant Treasurer. All changes of address should be sent directly to the Assistant Treasurer as well.

The Newsletter

The Newsletter is sent quarterly to members and appears simultaneously on the ASBS Website. It keeps 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. Citation: abbreviate as *Australas. Syst. Bot. Soc. Newslett.*

Contributions

Send copy to the Editor preferably by email attachment submitted as: (1) an MS-DOS file in the form of a text file (.txt extension), (2) an MS-Word.doc file, (3) a Rich-text-format or .rtf file in an email message or attachment or on an MS-DOS disk or CD-ROM. Non-preferred media such as handwritten or typescripts by letter or fax are acceptable, but may cause delay in publication in view of the extra workload involved.

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The deadline for contributions is the last day of February, May, August and November. All items incorporated in the Newsletter will be duly acknowledged. Authors alone are responsible for the views expressed, and statements made by the authors do not necessarily represent the views of the Australasian Systematic Botany Society Inc.

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A 20% discount applies for second and subsequent entries of the same advertisement. Advertisements from ASBS members are usually exempt from fees but not the insertion costs in the case of a flyer. Contact the Newsletter Editors for further information.

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