

ASBS

*Australian
Systematic
Botany
Society*



Newsletter

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AUSTRALIAN SYSTEMATIC BOTANY SOCIETY INCORPORATED

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Hansjörg Eichler Research Committee

Barbara Briggs
Rod Henderson
Betsy Jackes
Kristina Lemson
Chris Quinn
Chair: Peter Weston, Vice President (*ex officio*)
Grant applications close: 14th Mar/Sep annually

Affiliate Society

Papua New Guinea Botanical Society

ASBS Web site

www.anbg.gov.au/asbs

Webmaster: Murray Fagg
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No loose leaf inclusions with this issue

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Hardcopy: 1st August 2008; ASBS Web site: 3rd August 2008

From the President

It was with great pleasure that I accepted the honour of serving as President of the Society. As can be seen on the inside of the front cover of this Newsletter this was one of a number of changes in the makeup of Council that occurred at the recent AGM in Adelaide. Firstly, three hard working members have left, these being John Clarkson (former President), Darren Crayn (former Vice President) and Anna Monro (former Treasurer). I think I can speak for the entire society when I thank them for the excellent job they have done over the years. Their hard work and dedication will be missed and I wish them well in a Council-free world.

The Council for 2008/9 is:

- Mike Bayly (Research Fellow, MELU) has taken on the role of Treasurer. Mike's research interests include Rutaceae, Plantaginaceae and Gleicheniaceae.
- Kirsten Cowley (Research Assistant, CANB) who was a Councillor in 2005/6 and continues her excellent work as Secretary (since 2006) and ASBS's Public Officer (since 2003). Kirsten has a strong interest in plant nomenclature.
- Dale Dixon (Deputy Director, Museum & Art Gallery NT) who has been a Councillor since 2006 and hosted the ASBS conference in Darwin in 2007. His research interests, when he has time, include the systematics of *Ficus*, *Cycas* and *Portulaca*.
- Tanya Scharaschkin (Lecturer, QUT) joined the Council this year as a Councillor. Her main research interests include understanding the ecological and evolutionary biology of plants across varying temporal and spatial scales.
- Peter Weston (Senior Principal Research Scientist, NSW) joins the team as Vice President and has previously been on Council as a Councillor (1996-1999) when he chaired the inaugural Eichler Research Committee. Peter's research interests include the systematics of Proteaceae, Orchidaceae and Rutaceae.
- Lastly, myself (Senior Curator - Botany, HO); I have been a Councillor since 2003 and am now the President. My main research interests include the systematics of Rutaceae while the *Flora of Tasmania Online* Project consumes a significant percentage of my time.

Another significant change for the society this year will be a change of editors for the Newsletter. Robyn and Bill Barker have decided it is time to hand over the presses [more details elsewhere in this issue]. The first newsletter they edited was No. 108 (Sep. 2001) and they will finish on this one (7 years & 29 issues later!). I think I can

speaking for the entire society [again] when I thank them for the excellent job they have done over the years for the Newsletter as well as the society. Good luck to the new editors!

These are trying times for systematics in Australia and the world. The number of practicing taxonomists and systematists is becoming significantly smaller and funding is getting more difficult to procure. With a major global financial crisis underway I can not see it improving in the short term without significant additional resources. Granting bodies no doubt will have to make stronger cases to retain funding [or continue to exist] and/or look after investments etc more conservatively.

What can ASBS do as an advocate for research, systematics and conservation? A number of things are being done at the moment to raise the profile of the society which will assist in this role. The recently completed brochure can now be found at most universities and herbaria and has been seen at some conferences. It can be downloaded from the society's website or if you would like a number of hard copies please contact Kirsten Cowley. Websites are the first port of call of many when investigating a society and it is important that they are easy to use as well as inviting. The website is currently being reviewed by Council. Any suggestions for improvement would be most welcome.

Conferences are an essential part of society life and the society does offer some, if meagre, support for student attendance. There are conferences planned for Armidale (2009) and New Zealand (2010). The latter will tie in with the planned affiliation of ASBS and the New Zealand Plant Radiation Network. The up and coming IBC in Melbourne (2011) will be an excellent opportunity for the society to play an active role in promoting systematics. Maybe some serious student support can be offered to ensure that many of our student members experience an IBC early in their careers. Of course there are other things the society can and will do at the IBC and any suggestions would be welcome.

Are there other things that you think the society should be doing or could improve on? Please do not hesitate to contact any member of the Council about issues you may have or with suggestions of where the society could improve etc. I look forward to catching up with many of you soon.

Marco Duretto

ASBS Inc. business

2008 Annual General Meeting of the Australian Systematic Botany Society, Inc.

4:30 pm, Tuesday 30th September, at Bragg Lecture Theatre,
University of Adelaide, South Australia

Present: John Clarkson (President), Darren Crayn (Vice-President), Marco Duretto, Dale Dixon (Councillor) and 45 members, including two ASBS life members Robyn Barker and David Symon.

1. Apologies

Anna Monro, Kirsten Cowley, Bob Chinnock, Graham Bell and Jeremy Bruhl.

2. Minutes of the 2007 Annual General Meeting

Proposed that the minutes of the 29th Annual General Meeting (as published in *The Australian Systematic Botany Society Newsletter* Number 133 be accepted.

Moved Michael Bayly and seconded Wayne Gebert. Motion carried.

3. Business arising from minutes

Nil

4. President's report

Presented by John Clarkson. John's last report. Copy will be printed in the ASBS newsletter. Accepted with acclamation. **See Attachment 1.**

5. Treasurer's report

Prepared by Anna Monro and presented by Marco Duretto and to be printed in the ASBS newsletter. Robyn noted that newsletter mail out did not appear to match actual member numbers. Judy West asked how the ASBS brochures were being disseminated. Annette Wilson asked if applications for memberships could be included in the brochure.

Acceptance moved on behalf of Anna Monro by Marco Duretto, seconded by Judy West. Motion carried. **See Attachment 2.**

6. Newsletter & web page report

Newsletter: Robyn to supply newsletter report. John Clarkson moved that a vote of thanks be

extended to the Barkers for the Newsletter, seconded by Barbara Briggs. Motion carried. **See Attachment 3.**

Web Page: report not provided. Murray Fagg was absent. John Clarkson has contacted. A vote of thanks to Murray for his work was moved by John Clarkson, seconded by Robyn Barker. Motion carried.

7. Eichler Research Fund

As per power point presentation by Darren Crayn. Karen Wilson moved that a vote of thanks be extended to the committee, seconded by Bill Barker. Motion carried.

8. Any other business

International Botanical Conference (IBC) – update by Judy West. Article on update to be presented in the Newsletter. Professional conference company appointed - ICMS Australasia selected as conference organiser. Expecting 3,000-4,000 people. Tim Entwisle head of Science committee. Judy West chair of organising committee. Karen Wilson is the Secretary General. Field trips – to be coordinated by CHAH: State and Territory herbaria have agreed to provide leaders. Dale Dixon asked who needed to be approach for ASBS to run a program (answer - ASBS to approach Tim Entwisle). Robyn Barker asked what the venue is – new convention centre.

9. Election results

President: Marco Duretto

Vice president: Peter Weston

Secretary: Kirsten Cowley

Treasurer: Michael Bayly

Councillor: Dale Dixon

Councillor: Tanya Scharaschkin

The new president, Marco Duretto, moved a vote of thanks for the outgoing ASBS Council members.

Meeting closed: 5:41 pm

Attachment 1 - President's report

Welcome to the 30th Annual General Meeting of the Australian Systematic Botany Society. This is my last report as President of the Society. At the end of this meeting, having served 6 years on Council, the last 3 as President, it is time for me to make way for fresh blood and new ideas.

Since it was formed in 1973, ASBS has held conferences in every Australian State and Territory and twice overseas. This is our 33rd conference and the fourth to be held here in Adelaide. Bill Barker and his committee are to be congratulated

on once again delivering the quality program we have come to expect from the South Australians.

Despite difficult financial times, when Marco Duretto presents Anna Monro's Treasurer's report, you will see that the Society remains in a strong financial position. Anna has done a wonderful job over the past few years and will be a tough act to follow. I am sure she would have preferred to have stood down with the world financial market in a healthier situation than where we find it today. However, Council has always ensured that its investments are spread in a diversified, low to medium risk portfolio. Things will recover in time. At the moment we have more than enough funds in cash to ensure the Eichler Fund can continue to offer grants without having to draw on the managed funds while their unit values are depressed. The general fund, which has very little exposure to the share or property market has finished the year with a modest surplus and a healthy bottom line. Just as we did in 2001 and 2002 when we celebrated the Brown bicentenary, there are ample funds to divert to special projects such as the upcoming IBC in Melbourne.

Of the many things the Society undertakes, none gives me more satisfaction than the support and encouragement it provides to student members. Students represent the future of plant systematics and are the life blood of the Society. Financial support, albeit still somewhat modest, is available through the Hansjörg Eichler Research Grants. These are now in their 11th year. Students pay discounted annual subscriptions. They are usually offered special registration fees for our annual conferences and this can usually be recouped in full if they present an oral presentation or poster. At this conference we introduce another incentive - a student prize for the best oral presentation. This prize has been named the Pauline Ladiges Prize in recognition of the wonderful support and encouragement that Pauline has provided to scores of students over many years. Pauline is disappointed that she cannot be here in Adelaide for the inaugural award. She has a prior commitment to present a talk in London. Council would like to thank CSIRO Publishing who has provided a \$250 book voucher and a personal online subscription to Australian Systematic Botany as a prize for the winning presentation. This award will be a regular feature of ASBS conferences. The award will be judged by a panel comprising the 2 non executive members of Council and a nominee of the organising committee. The panel this year is chaired by Marco Duretto who is assisted by Dale Dixon and Juergen Kellermann.

Hopefully, by now, members will have seen the brochure promoting the Society which was produced earlier this year. It has been distributed

widely to herbaria and university botany departments. This project dates back many years and I was keen to see it brought to a conclusion during my time as President. Thanks to Kirsten Cowley and Anna Monro who drove the project to a successful conclusion with excellent design input from Siobhan Duffy, a professional graphic designer from CSIRO, acting in a freelance capacity, this has been achieved. Council has now embarked on a thorough review of the content and appearance of the Society's web page and once again we have engaged Siobhan to assist with the design.

Council is pleased to announce a formal affiliation between ASBS and the New Zealand Plant Radiation Network. A memorandum of understanding will soon be signed by the two societies. Where this will take the two societies we will have to wait to see but with the systematic botanical communities in Australia and New Zealand being as small as they are, and unlikely to grow by much, if at all, Council feels that there are many benefits to be had by working together in this way.

Council has worked hard on planning for future conferences. Conferences are one of the best ways of bringing the Society's widely dispersed membership together. Forward planning helps ensure they will be held on an annual basis. Next year the conference will be in Armidale and Ian Telford will be giving his sales pitch on Thursday. The following year we will celebrate our affiliation with the New Zealand Plant Radiation Network by meeting jointly with them in Christchurch. Trans Tasman travel now costs no more, or in many cases less, than interstate travel, so it should be well within the reach of Australian members. 2011 will be the biggie. That year the ASBS conference will coincide with the XVIII International Botanical Congress to be held in Melbourne. I hope the incoming Council can negotiate a role for ASBS within the IBC program.

Since the conference held in Brisbane in 2005, workshops or master classes have become a feature of ASBS conferences. The numbers of members attending suggest that they are meeting a need for ongoing professional development. In the 4 years we have covered subjects as diverse as botanical nomenclature, molecular techniques, Botanical Latin, bryophyte curation and, this year, an introduction to building interactive identification tools using the Lucid3 suite of programs run by Kevin Thiele. Thank you Kevin. I hope future Councils will continue this initiative. Members can help by suggesting topics they would like to see covered.

This year will see one of the largest change overs in the composition of Council for some time.

Three members of Council will step down at the end of this meeting to be replaced by three new councillors. Council knew this was coming and has been working hard to ensure a smooth transition. A few old hands remain to ensure continuity and Peter Weston, who has been elected unopposed to the position of Vice President, brings prior Council experience having served 3 years as a Councillor from 1996 to 1999. Periodic change in Council is enshrined in the Society's rules. These wisely allow an individual only 6 consecutive terms on Council and only 3 consecutive terms as President or Vice President. This ensures Council is periodically infused with fresh ideas. This year we had three nominations for the two Councillor positions. This triggered an election for, what I believe, is only the second time in the Society's history. Thank you for taking the interest to vote. The results will be announced towards the end of this meeting. I would like to take this opportunity to congratulate the successful nominees and wish them well. I hope they get as much satisfaction out of serving the Society as I have had. My commiserations go to the unsuccessful candidate. Don't lose heart. There will be an opportunity next year when Marco completes his 6th term and steps down.

So there you have it. I have thoroughly enjoyed what has been my second 6 years stint on Council. Over the last 3 years I hope I have been

able to live up to the expectations of those who encouraged me to nominate for the position of President.

In closing I would like to thank on behalf of Council and all the members of the Society all those who keep the Society functioning - Robyn, Jenny and Bill Barker who do such a wonderful job with the Newsletter, Murray Fagg who manages the web site and the current members of the Eichler Scientific Committee Barbara Briggs, Betsy Jackes, Kristina Lemson and Chris Quinn and Tom May who stood down from the Eichler Scientific Committee earlier this year.

I would especially like to thank my Council colleagues Darren Crayn, Kirsten Cowley, Anna Monro, Marco Duretto and Dale Dixon. I am sorry that Kirsten and Anna cannot be here this afternoon but I rang them personally on Friday and thanked them. Except for Dale who has served only 2 terms on Council, the rest of us have worked together since I assumed the President's role in 2005. My association with Darren and Marco dates back to 2003 and with Anna to 2004 when Steve Hopper was in the chair. Thank you all for your enthusiasm and support. You were a great team to work with.

I offer my best wishes to the incoming Council. I am sure the Society remains in very good hands.

John Clarkson

Attachment 2 - Treasurer's report

1. Introduction

I am pleased to present the financial statements of the Australian Systematic Botany Society (ASBS) for the year ended 30 June 2008. The finances of the Society are run on a financial year basis and Anna Monro served as Treasurer for this accounting period. This will be my final Treasurer's report and I regret that I am unable to present it in person at the AGM, but would like to thank my fellow Councillors for providing a summary in my absence.

2. Membership

Membership of ASBS currently hovers at around 310, which is the same level as at the end of the 2006/07 financial year. There has been a slight increase in the number of full members and a slight decrease in concessional memberships, although these may be the same people changing their status or new members altogether. Twenty-nine unfinancial members who had not paid their dues since 2005 were written off at the end of 2007. Thirty-two new individual members joined ASBS between 1 July 2007 and 23 September 2008 (see list below).

Approximately 13% of paying members remain unfinancial, which is around the base level at

this stage in the year. Two e-mail reminders have been sent to unfinancial members at this point in addition to the reminders on the newsletter envelopes. Members who had not paid their subscription fees by 30 June were removed from the mailing list for newsletters, in accordance with Council's current policy.

The following new members for 2007 and 2008 are welcomed to the Society:

Miss Carol Austin, Deakin University, Vic.
Mr Matthew Baker, Tasmanian Herbarium, Hobart, Tas.
Dr Michelle Barthet, School of Biological Sciences, University of Sydney, N.S.W.
Mr Richard Boyne, Queensland University of Technology, Brisbane, Qld.
Ms Gael Campbell-Young, Ecological Associates Pty Ltd, Netherby, S.A.
Mr Endymion Cooper, National Herbarium of New South Wales/University of Sydney, N.S.W.
Mr Craig Costion, Department of Ecology & Evolutionary Biology, University of Adelaide, S.A.
Dr Hugh Cross, State Herbarium of South Australia, Adelaide, S.A.
Ms Sarah Fayed, University of Tasmania, Hobart, Tas.
Dr Fred Gurgel, State Herbarium of South Australia, Adelaide, S.A.
Dr Murray Henwood, School of Biological Sciences, The University of Sydney, N.S.W.

Mr Gareth Holmes, University of Melbourne, Vic.
 Mr Eric Hsu, School of Plant Science, University of Tasmania, Hobart, Tas.
 Mr Peter Innes, University of New England, N.S.W.
 Dr Régis Julien, Quatre Bornes, Mauritius.
 Prof. Andrew Lowe, State Herbarium of South Australia, Adelaide, S.A.
 Mr Craig Marston, Queensland University of Technology, Brisbane, Qld.
 Mr Rohan Mellick, National Herbarium of New South Wales, Sydney, N.S.W.
 Mr Andre Messina, La Trobe University, Vic.
 Dr Joe Miller, Centre for Plant Biodiversity Research, Canberra, A.C.T.
 Dr Michael Moody, School of Plant Biology, University of Western Australia, Crawley, W.A.
 Mr Iain Moore, University of New England, Armidale, N.S.W.
 Dr Sheldon Navie, School of Land, Crop & Food Sciences, University of Queensland, St Lucia, Qld.
 Ms Belinda Pellow, Janet Cosh Herbarium, University of Wollongong, N.S.W.
 Ms Olgney Pinto da Silva, University of New South Wales, Sydney, N.S.W.
 Ms Laura Shirley, School of Botany, University of Melbourne, Vic.
 Ms Margaret Stimpson, University of New England, N.S.W.
 Mr Ben Stuckey, Northern Territory Herbarium, Palmerston, N.T.
 Ms Nan Thomas, University of New England, N.S.W.
 Mr Michael West, Caringbah, N.S.W.
 Dr Annabel Wheeler, Australian Biological Resources Study, Canberra, A.C.T.
 Mr Jim Williams, Jim's Seeds, Weeds & Trees Pty Ltd, Boulder, W.A.

3. General Fund

Steve Holmes, of WalterTurnbull in Canberra, audited the 2007/08 books in September 2008. This is the second time that this company has audited the Society's financial statements.

3.1 Income

Income to the General Fund increased in 2007/08, even when the extended 18-month accounting period used in 2006/07 is taken into account. This is due largely to the profits from both the Darwin and Cairns conferences being received in 2008. Our last term deposit was closed in November 2007, as it was difficult to keep track of the best rates and to renew at the right time. The \$10,000 principal was moved to an online savings account that currently pays 7.30% interest and is linked to the General Fund cheque account. The interest rate is comparable to most term deposits available, but does not stipulate a minimum deposit or tie the money up for a set period. This will also be a convenient place to store any surplus cash in the General Fund while considering investment options. Investment earnings and conference proceeds meant that the General Fund ended June 2008 with a surplus of \$14,807.

Subscription fees from members are the major source of income to the General Fund and they returned to the usual level of around \$10,000 per year after the artificially inflated level of the previous 18-month accounting period. Given the fairly healthy state of the General Fund, Council doesn't feel it is necessary to increase subscription rates at this point. This is again something for the new administration to keep an eye on, especially if the handover of the newsletter editing involves new printing and distribution arrangements. The current suppliers and the efforts to keep members financial has probably been responsible for the relatively constant level of the outlay in this area (see Item 3.2).

Book sales continue at their previous rather low rate and Council has recently discussed ways to write off the remaining stock of our titles and pay out the remaining amounts owing to shareholders, as the administration required is disproportionate to the amount the Society earns in sales. This is something the new Treasurer may well wish to finalise in the current financial year. See the Current Assets section below for details of the publication stock levels as at 30 June 2008.

3.2 Expenditure

Expenditure in 2007/08 increased slightly when compared to that in the previous accounting period. This was largely due to some occasional and one-off expenses, including the payment of five years' worth of sale profits to the shareholders in the *History of Systematic Botany in Australasia* book. There were also costs associated with the design and production of a brochure to publicise ASBS to potential members. This project has been discussed over all the time I have spent on Council, so it was fantastic to see the brochure distributed in May 2008. It will be interesting to see whether the added publicity results in an increased income from subscriptions in the next financial year. Newsletter printing and postage were again the major expense for the General Fund, although they were slightly lower than those of previous years. This was probably due to the production of a combined issue 131/132. Including this as a single issue, three newsletters were printed in 2007/08 with an average cost per issue of around \$1,137 (\$1,000 in 2006/07, \$1,185 in 2005).

Table 1. ASBS Membership as of 23 September 2008 (unfinancial members bracketed)

Fee	Full	Con- cessional	Gratis	Total
Ordinary	190 (27)	n/a	0	190 (27)
Student	n/a	44 (7)	0	44 (7)
Retiree	n/a	51 (3)	0	51 (3)
Institutional	9	n/a	15	24
Life	n/a	n/a	3	3
Total	199 (27)	95 (10)	18	312 (37)

The fees and charges associated with the acceptance of credit card payments increased slightly over those of previous years, totalling \$378.39. This can be explained by the fact that 62% of all payments received over the 12 months were made via credit card and the fees charged are partially based on the amounts processed. This facility has been used by an increasing number of members since it was first offered in January 2004.

3.3 Current Assets in the General Fund

At the end of June 2008 the Society held assets of \$83,077 (\$82,622 in cash, \$455 in books). This represents an increase over the 2006/07 level.

The books that the Society fully or partially owns, held by Helen Thompson (ASBS sales) and by state chapter conveners, as at 30 June 2008 are as follows:

- 28 copies of *History of Systematic Botany in Australasia* (partial share)
- 0 copies of the *Proceedings of the Dampier 2000 conference* (remaining three copies at PERTH could not be found and have been written off)
- 14 copies of *Systematic Status of Large Flowering Plant Genera*
- 66 copies of *Evolution of the Flora and Fauna of Arid Australia* (partial share)

4. The Hansjörg Eichler Research Fund

The 2007/08 financial year was not a good one for the Research Fund investments, which suffered from the current instability of the stock market. This is perhaps inevitable after several years of strong growth. A loss of \$12,736 was incurred over all the investments, with the growth and diversified funds performing the worst. This resulted in an overall loss to the Research Fund for the 2007/08 financial year of \$1,079. However, the amount of units in all the funds increased over the period and the losses reflect only the change in value of the units. This should mean that earnings will increase once the markets recover. Council have discussed buying further units in an investment fund, as there is quite a lot of money currently being held as cash. Rather than locking the new administration into anything this will be something for the incoming Treasurer to evaluate and act on.

Five grants totalling \$9,828 were awarded to students in 2007/08, with three successful applicants in the September 2007 round and two in March 2008. These were paid directly from the research cheque account.

Current assets decreased from \$331,155 to \$330,076 in the 12 months ended 30 June 2008. This was offset by the generous donations of members, with around 50 individual donations

to the Fund in the period. Donations ranged from \$5 upwards, with donations over \$2 being tax-deductible. These contributions help the Society to support systematic research into the Australian flora.

5. Taxation

The ASBS continues with its tax-exempt status. Organisers of conferences are reminded that ASBS is not registered as a GST gathering organisation. Planners of large conferences need to obtain an ABN and the relevant status or work through a registered institution (such as a herbarium). The current conference is being run in this manner. Smaller conferences and workshops can be run through the Society as long as no GST is charged or recovered.

6. Summary

The General Fund retained a sizeable surplus in 2007/08. Income to the General Fund was boosted via profits from the Cairns and Darwin conferences and by investment earnings. The Hansjörg Eichler Research Fund unfortunately has suffered from the downturn in world financial markets but the wisest course seems to be to ride out the fluctuations, with Council remaining confident of recovery and further growth in the longer term.

I have served as Treasurer for four years now, after responding with naive enthusiasm to my supervisor's question "Do you like money?". I am very happy to be handing over to someone new who will doubtless bring a similar enthusiasm to the role and I have learnt a lot from the experience (not least that it is wise to examine seemingly innocuous questions for hidden meaning). I would like to convey my thanks to all the people who've served on the ASBS Council over these years for their helpful input on financial matters and for making the time enjoyable. I've also had very positive interactions with our newsletter editors, conference organisers and a wide range of the Society's members (even when hounding them for payments).

There has been an ongoing debate whenever we have to submit a form to the Registrar-General to change the details of Council members, as there is no option provided for those whose term has ended under the Constitution or those who are not standing for re-election. The only possibility listed for people leaving Council voluntarily is that they have "Resigned". Having noticed that the alternatives are "Dismissed" or "Deceased", I hereby tender my resignation with the feeling that I am getting off lightly!

Anna Monro
Honorary Treasurer
September 2008

AUSTRALIAN SYSTEMATIC BOTANY SOCIETY INCORPORATED

COUNCIL MEMBERS' REPORT

Your Council members submit the financial statement of the Australian Systematic Botany Society Incorporated for the year ended 30 June 2008.

Council Members

The names of the Council members who held office throughout the reporting period and at the date of this report are:

President	John Clarkson
Vice President	Darren Crayn
Secretary	Kirsten Cowley
Treasurer	Anna Monro
Councillors	Marco Duretto
	Dale Dixon

Public Officer

Kirsten Cowley

Principal Activities

The principal activities of the association during the reporting period were to promote systematic botany in Australia.

Significant Changes

No significant change in the nature of these activities occurred during the reporting period.

Operating Results

The operating results are as set out hereunder:

	Year ended June 2008	January 2006 to June 2007
	\$	\$
Research Fund	(1,079)	45,119
General Fund	14,807	14,195
Total	13,728	59,314

Signed in accordance with a resolution of the members of the Council.

John Clarkson (President)
Anna Monro (Treasurer)
16 September 2008

**INCOME STATEMENT
FOR THE 18 MONTHS ENDED 30 JUNE 2008**

RESEARCH FUND

	Note	2008	18 months to June 2007
Income			
Donations to Research Fund		20,000	20,000
Investment Income	2	(12,736)	35,455
General Fund Transfer		1,485	2,664
		8,749	58,119
Expenditure			
Research Grants		9,828	13,000
Bank Charges		-	-
		9,828	13,000
Surplus	3	(1,079)	45,119

**INCOME STATEMENT
FOR THE YEAR ENDED 30 JUNE 2008
GENERAL FUND**

	Note	2008	18 months to June 2007
Income			
Sales - Books		329	152
		329	152
Less Cost of Goods Sold			
Opening stock - Books		706	721
Closing stock - Books		(455)	(706)
Cost of Goods Sold		251	15
Gross Revenue from Trading		78	137
Advertising		-	250
Conferences		10,124	3,803
Investment Income	2	3,433	4,129
Subscriptions to ASBS Inc.		9,950	18,036
Donations to Eichler Fund		1,615	2,434
Sundry Income		74	38
Total Income		25,274	28,827
Expenditure			
Transfer of member donations to Eichler		1,485	2,664
Auditors' remuneration		1,210	1,000
Bank fees		-	-
Credit card charge facility		378	490
Conference expenses		2,807	3,705
Newsletter expenses		3,411	6,003
History book sales – profit share		243	-
Constitutional change mail outs		-	332
Registrar general returns		31	58
Miscellaneous expenses (e.g. postage)		902 ¹	380
Total Expenditure		10,467	14,632
Surplus	3	14,807	14,195

The accompanying notes form part of these financial statements.

**BALANCE SHEET
As at 30 June 2008**

	Note	2008	2007
		\$	\$
ASSETS			
Current Assets			
Research Fund			
Cash at Bank		960	953
Investments			
Colonial Managed Investment		68,670	81,405
Cash Management Fund		117,137	98,369
Australian Bond Fund		74,204	71,169
Growth Fund		69,105	79,259
		330,076	331,155
General Fund			
Cheque Account		26,733	14,866
Savings Account		10,431	-
Investments			
Term Deposit		-	10,000
Cash Management Account		45,458	42,698
Inventories - Books		455	706
		83,077	68,270
Total Current Assets		413,153	399,425
NET ASSETS		413,153	399,425
MEMBERS' FUNDS			
Accumulated surplus - opening	3	399,425	340,111
Surplus for the period	3	13,728	59,314
Total Members' Funds		413,153	399,425

The accompanying notes form part of these financial statements.

¹ Comprises costs of ASBS brochure design and printing

AUSTRALIAN SYSTEMATIC BOTANY SOCIETY INCORPORATED
NOTES TO AND FORMING PART OF THE FINANCIAL STATEMENTS
FOR THE YEAR ENDED 30 JUNE 2008

Note 1: Statement of Significant Accounting Policies

The financial report is a special purpose financial report prepared in order to satisfy the financial reporting requirements of the members. The Council has determined that the Society is not a reporting entity.

The financial report has been prepared in accordance with the requirements of Australian Accounting Standard AASB 1031: Materiality. No other applicable Accounting Standards, Australian Accounting Interpretations or other authoritative pronouncements of the Australian Accounting Standards Board have been applied.

The financial report has been prepared on a cash basis.

The following specific accounting policies, which are consistent with the previous period unless otherwise stated, have been adopted in the preparation of this financial report.

(a) Membership

Membership is recorded on a cash basis.

(b) Income Tax

Under present legislation the Society is exempt from income tax and accordingly no provision has been made in the accounts.

(c) Comparative Figures

Where required by Accounting Standards comparative figures have been adjusted to conform with the changes in presentation for the current year.

(d) Members Funds

In accordance with the rules of the Society accumulated funds are not available for distribution to its members.

Note 2: Investment Income

	2008	18 months to June 2007
	\$	\$
RESEARCH FUND		
Interest Received		
Cheque Account	7	12
Distributions		
Colonial First State (Diversified Fund)	(12,735)	12,623
Cash Management Trust	7,111	7,070
Australian Bond and Growth Fund	(7,119)	15,750
Total Research Investment Income	(12,736)	35,455
GENERAL FUND		
Interest Received		
Cheque Account	103	108
Savings Account	431	-
Term Deposits	139	865
Distributions		
Cash Management Trust	2,760	3,156
Total General Investment Income	3,433	4,129

Note 3: Accumulated Funds

RESEARCH FUND

Accumulated Surplus – Opening	330,560	285,441
Surplus for the period	(1,079)	45,119
Accumulated Surplus – Closing	329,481	330,560

GENERAL FUND

Accumulated Surplus – Opening	68,865	54,670
Surplus for the period	14,807	14,195
Accumulated Surplus – Closing	83,672	68,865

Total Surplus for the period	13,728	59,314
Total Accumulated Surplus	413,153	399,425

Note 4: Research Committee

The Australian Systematic Botany Society is an approved research institute.

The approved membership of the Research Committee comprises:

Barbara Briggs	Appointed July 2003	Kristina Lemson	Appointed Feb. 2008
Rod Henderson	Appointed July 2003	Tom May	July 2003–Feb. 2008
Betsy Jackes	Appointed July 2003	Chris Quinn	Appointed July 2003

AUSTRALIAN SYSTEMATIC BOTANY SOCIETY INCORPORATED

Statement by the Members of the Council

The Council has determined that the Society is not a reporting entity and that this special purpose financial report should be prepared in accordance with the accounting policies outlined in Note 1 to the financial statements.

In the opinion of the Council:

1. The financial report as set out on pages 7 to 10 presents a true and fair view of the Society's financial position as at 30 June 2008 and its performance for the year ended on that date.
2. At the date of this statement, there are reasonable grounds to believe that the Society will be able to pay its debts as and when they fall due.

This statement is made in accordance with the resolution of the Council and is signed for and on behalf of the Council by:

President: *John Clarkson*

Treasurer: *Anna Monro*

Dated this 16th day of September 2008

INDEPENDENT AUDITOR'S REPORT TO THE MEMBERS OF THE AUSTRALIAN SYSTEMATIC BOTANY SOCIETY INCORPORATED

Scope

The Financial Report and Council's Responsibility

We have audited the financial report, being a special purpose financial report, comprising the balance sheet, income statement and accompanying notes to the financial statements for the Australian Systematic Botany Society Inc (the Society) for the year ended 30 June 2008. The Society's Council is responsible for the financial report and has determined that the accounting policies used, as described in Note 1 to the financial statements which form part of the financial report, are consistent with the financial reporting requirements of the Society's constitution and are appropriate to meet the needs of the members. We have conducted an independent audit of the financial report in order to express an opinion on it to the members of the Society. No opinion is expressed as to whether the accounting policies used are appropriate to the needs of the members.

The financial report has been prepared for distribution to members for the purpose of fulfilling the Committee's financial reporting requirements under the Society's constitution. We disclaim any

assumption of responsibility for any reliance on this report or on the financial report to which it relates to any person other than the members, or for any purpose other than that for which it was prepared.

Audit Approach

Our audit has been conducted in accordance with Australian Auditing Standards. The nature of an audit is influenced by factors such as the use of professional judgment, selective testing, the inherent limitations of internal control, and the availability of persuasive rather than conclusive evidence. Therefore, an audit cannot guarantee that all material misstatements have been detected.

Our procedures included examination, on a test basis, of evidence supporting the amounts and other disclosures in the financial report, and the evaluation of significant accounting estimates. These procedures have been undertaken to form an opinion whether, in all material respects, the financial report is presented fairly in accordance with the accounting policies described in Note 1 to the financial statements. These policies do not require the application of all Accounting Standards and other mandatory professional reporting requirements in Australia.

While we considered the effectiveness of management's internal controls over financial reporting when determining the nature and extent of our procedures, our audit was not designed to provide assurance on internal controls.

The audit opinion expressed in this report has been formed on the above basis.

Independence

In conducting our audit, we followed applicable independence requirements of Australian professional ethical pronouncements.

Audit Opinion

In our opinion, the financial report presents fairly, in accordance with the accounting policies described in Note 1 to the financial statements, the financial position of the Australian Systematic Botany Society Inc as at 30 June 2008 and its financial performance for the period then ended.

Stephen Holmes, Walter Turnbull
Chartered Accountant
Canberra ACT
September 2008

Attachment 3 - Newsletter report

Having just reviewed some earlier newsletters and newsletter reports in order to produce this report it is interesting to see how imperceptibly things change.

Some things never seem to change – for instance the cost of the newsletter is still marked on the front cover as being \$5.00 – and it has been that price since about 1989/90. From a quick look at the Treasurers Report we are still producing each issue of the newsletter for slightly under this price. Just to give some idea of the changes in cost with respect to newsletter production, issue 33 (1982) was priced at \$2.00, issue 41 (1984) at \$3.00 and issue 46 (1986) at \$3.50.

The newsletter has now been edited by us since issue 108 (September 2001) and each editor brings to the process their own particular foibles. Layout for all of the issues has been the responsibility of Bill, and he believes in getting value for money with respect to printing space. When you have to produce pages in multiples of four it soon becomes obvious that you need to have a number of items in reserve in case you are just over or just under that magic number – hence the development of many of the “filler” type

items such as “Websites”, “Food for thought”, “Miscellanea”, “Conferences”, “From Taxacom” and “Book notices”. Since news is mostly offered by different media outlets in small bites of information it seems we are keeping up with the times!

When we first started Bill used Microsoft Word to produce the newsletter and this caused no end of problems. With the switch to Adobe InDesign in the last couple of years there has been a lot happier atmosphere surrounding the production of each newsletter although there are still minor hiccups and glitches to be watched out for. The final copy of the newsletter is converted to a pdf and then sent off electronically to the printers. A proof is usually produced for us within a day and the almost 300 copies of the newsletter then usually take a couple of days to be printed and delivered to the State Herbarium. In these couple of days we produce any inserts required and print the envelopes from an up to date file of members provided by the long-suffering treasurer who doesn't always get as much notice as she might like. Printing the envelopes can also be a time of stress – it is generally an out-of-hours job as we use the State Herbarium printer for this and

we can't afford to monopolise it during working hours for the couple of hours it takes¹. Envelopes, newsletters and inserts are then delivered to Bedford Industries for packaging and posting. A pdf of the newsletter is also sent to Murray Fagg at this time for placing on the ASBS web page.

It has been my job to "chase" up and receive contributions for the newsletter, contact book publishers, liaise with contributors and get together those filler items. This is generally quite enjoyable as it gives me an excuse to go web browsing and justifies my belonging to some news groups on the web. And our library hopefully sees my suggestions of purchases as a benefit and not a chore. My only problem with this process is that there is a bias in what appears in print, or what books are reviewed. However some members, particularly Karen Wilson, Tony Bean, Stephen van Leeuwen, Barry Conn, Juergen Kellermann and Philip Short have taken to passing on items of interest they have come across as well and this is only to be encouraged if we are to have a healthy newsletter.

We are still not necessarily getting news from the state chapters although Kevin Thiele and Daren Crayn have certainly been keeping us informed re happenings in Western Australia and the new Australian Tropical Herbarium in Cairns respectively. And we need to thank the regular contributors in ABRS and, more particularly, the two ABLOs of the past year. Jenny Tonkin and Jeremy Bruhl have really spoiled us in keeping us up to date and in contact with what is happening in Kew and Europe. Please don't anyone tell them that there is no obligation for them to produce a report for each newsletter since the newsletter would be much poorer if their contributions did

not arrive so regularly. I thought it would be hard for Jeremy to follow on from Jenny since she set such a high standard, but Jeremy has brought his own unique perceptions as well as offering a selection of photographs for use in each report.

There have been four issues of the newsletter printed since September 2007. The one published just before the AGM in Darwin was numbered 131-2 since there was no June 2007 issue. The December issue, number 133, made up for this since it was probably the largest produced in our time as editors. Newsletters 134 and 135 saw our daughter Jenny introduced to the editing fold. Jenny did a Ph.D. involving wood identification and since finishing that had been working as a Communications Officer for the Weeds CRC. With the closure of that body she is now a Senior Communications and Marketing Officer with the South Australian Government's Department of Water, Land and Biodiversity Conservation. She has been putting the original copy into InDesign to an almost finished stage and then Bill has done the final "tweaking" to the same editing requirements adopted over the last issues.

We indicated in the last 12 months that we would like to step down from the editing – indeed it is likely that it would have been difficult for Bill to continue since he is planning to spend some time in New Zealand earlier in 2009 to complete work on *Euphrasia*. It causes us some regret that this issue of the newsletter will be our last but it is very heartening that others have stepped up to take on this role, and it is even more pleasing that they represent younger members of the Society. We wish them all the best and hope that the experience is as positive for them as it has been for us.

So thanks again to all of you who have contributed in so many different ways to the newsletter in our time as editors.

Robyn, Bill and Jenny Barker

¹ This is probably one of the few ways in which the State Herbarium offers support to the production of the newsletter – almost all of the work towards it is done in out-of-hours time but we do use the printers and computers of the herbarium for putting the newsletter together and for communication and web research.

Welcome to the new editors

Russell Barrett of Kings Park and University of Western Australia and Gael Campbell-Young of Ecological Associates in Adelaide have volunteered to take over the editing of the newsletter. Peter Jobson may also be part of the team if work commitments allow it. We will leave them to introduce themselves in their first issue.

We hope that they find the process of producing the newsletter for the society as rewarding a one as we have and we urge you to inundate them with copy for their first issue. Because they are in different cities it will probably take a little while for them to work out their different roles, but Russell will be producing the Newsletter in Adobe InDesign as we have been doing for the last 18 months and until they have worked out printing and distribution it is likely that this will continue in Adelaide for at least the first couple of issues. Their contact details are given inside the back cover of this issue.

Nancy Burbidge Medal

The Nancy Burbidge Medal (Fig. 1) was struck in 2001 with Judy West being the first recipient.

The medal is awarded by the Australian Systematic Botany Society on the recommendation of Council to a person who has made a substantial contribution to Australian systematic botany.

It is the foremost honour which can be bestowed by the Society.

Nancy Tyson Burbidge (1912 – 1977)

Nancy Burbidge was born in England in 1912 and came to Australia with her parents in 1913. She was educated at Katanning Church of England Girls School in Western Australia, the Bunbury High School and the University of Western Australia where she graduated with a BSc in 1937. On graduation she was awarded a scholarship and spent 18 months at the Royal Botanic Gardens, Kew where she undertook the first of several studies of Australian grass genera.

On returning to Australia she continued her studies on the Western Australian flora. In 1943 she was appointed assistant agronomist at the Waite Agricultural Research Institute in Adelaide and began work on the regeneration of native pastures in arid and semi-arid regions of South Australia. In 1946 she moved to Canberra where she was appointed to the new position of systematic botanist with CSIRO Division of Plant Industry.

Another year was spent in Kew in 1953 as the Australian Botanical Liaison Officer.

1955 to 1970 were perhaps her most productive years. During this period she produced over 50 scientific papers including a comprehensive paper on the phytogeography of the Australian region

and revisionary studies on such diverse genera as *Nicotiana*, *Sesbania* and *Helichrysum*. She also authored or co-authored a number of books including the *Flora of the Australian Capital Territory*, *Australian Grasses* and the *Dictionary of Australian Plant Genera*.

In 1961 she was awarded the degree of Doctor of Science from the University of Western Australia.

A competent administrator as well as a talented botanist, she was promoted to Senior Principal Research Scientist in 1967.

Later in her career Nancy was heavily involved in the development of the Flora of Australia, directing the project from 1973 to 1977. She was a founding member of the National Parks Association of the ACT, a long term member of the Australian Federation of University Women and President and International Secretary of the Pan Pacific and South East Asian Women's Association.

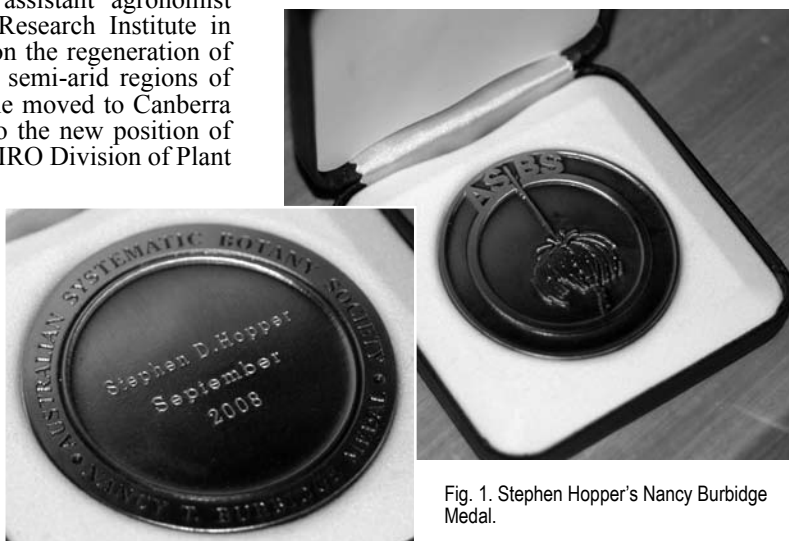


Fig. 1. Stephen Hopper's Nancy Burbidge Medal.

Nominations for the Nancy Burbidge Medal

Nominations for the award of the Nancy Burbidge Medal can be made at any time. The award is made to a person who has made a substantial contribution to Australian systematic botany. The award is not necessarily made each year. Nominees need not be members of the Australian Systematic Botany Society but must be proposed and seconded by two financial members of the Society. Nominations shall include a statement outlining the contribution of the nominee to Australian systematic botany, a curriculum vitae and the names of 2 referees. The award is made by the Australian Systematic Botany Society on the recommendation of Council. Nominations should be sent to the Secretary marked private and confidential.

The Royal Society of New South Wales awarded her the W.B. Clarke Medal in 1971 for her achievements in taxonomic botany and ecology and she was made a member of the Order of Australia in 1976.

She was one of the initiators of the Australian Systematic Botany Society and established the Committee of Heads of Australian Herbaria in 1973.

The inaugural ASBS Nancy Burbidge Lecture "The Role of Herbaria in Australia Today" was delivered by Selwyn Everist in Sydney in 1979. Other Burbidge lecturers and the titles of their lectures can be seen in the history of conferences on the ASBS website.

It is with great pleasure that I introduce the 2008 ASBS Nancy Burbidge Medallist Professor Stephen Hopper.

Professor Stephen Donald Hopper

Professor Hopper is a plant conservation biologist, best known for:

- his pioneering research leading to positive conservation outcomes in south-west Western Australia, one of the few temperate-zone global biodiversity hotspots, and
- for his collaborative description of over 300 new plant taxa.

Although born in New South Wales, Steve is probably identified by most botanists as a Western Australian. He completed his BSc with first class

honours at the University of Western Australia in 1973 then proceeded to undertake study towards a PhD at the same institution on speciation in the kangaroo paw genera *Anigozanthus* and *Macropidia*. The degree was conferred in 1978.

Following graduation Steve was employed as a research officer with the Western Australian Department of Fisheries and then research scientist and senior research scientist with the Western Australian Department of Conservation and Land Management.

From 1988 to 1992 he was Senior Principal Research Scientist and Office in Charge of the Wildlife Research Centre for the Western Australian Department of Conservation and Land Management. In this role he directed work in the research programs of Biogeography, Fauna Conservation, Fire, Marine Conservation, Research Techniques and Wetlands and Waterbirds and personally conducted research in the conservation biology, systematics and evolutionary genetics of eucalypts, orchids, Haemodoraceae, endangered plants, and plants on granite outcrops. Major outcomes achieved at this time included pioneering research on the conservation of Western Australian flora, and the creation and implementation of significant policy to list endangered plant species and secure their conservation. Some of these approaches have become standard practice Australia wide

Steve joined Kings Park and Botanic Garden as the Director in 1992 and from 1999 to 2004 served as the Chief Executive Office of the Botanic Gardens and Parks Authority which manages Kings Park and Botanic Garden and Bold Park. There he led the refurbishment and revitalization of the organization to world-class standards.

While doing this he still found time to continue his own research programme including:

- studies contributing to recognition of southwest Australia as one of the world's 25 global biodiversity hotspots;
- developing and testing evolutionary hypotheses on the origins of plant species richness in the world's Mediterranean climate regions;
- studies leading to a clarification of aspects of vertebrate pollination ecology, flora conservation, and conservation genetics applying to the Australian flora;
- discovery and description of over 300 new south-west Australian plant taxa, primarily eucalypts, orchids and Haemodoraceae;
- revising phytogeographic concepts and regionalisation for the ancient landscapes of south-western Australia and the Greater Cape Region of South Africa; and the
- development of collaborative international programs on the biogeography and conservation of granite outcrop floras.



Fig. 2. John Clarkson, President of ASBS presenting the Nancy Burbidge Medal to Stephen Hopper at the Adelaide Conference. Ph. Bill Barker

Steve was Foundation Professor of Plant Conservation Biology at the University of Western Australia a role he held from July 2004 – October 2006. Here he provided academic leadership in establishing and teaching new degrees in conservation biology; continued his research in conservation biology, evolution, systematics, and ecology; and developed new theory on the evolution and conservation of biodiversity.

In October 2006 he was appointed to his current position of Director, Royal Botanic Gardens, Kew, where he is responsible for the world's largest collection of living plants; two major visitor attractions at Kew and Wakehurst Place in Sussex; historic collections assembled over 250 years; and vital scientific programmes that reach out across the world in support of biodiversity and conservation.

Steve is a prolific author and has written, co-authored or edited 8 books and over 250 scientific papers over half of which have been published in peer reviewed journals.

You might think that heading up one of the world's premier botanical institutions might slow this down at least a little but no. He currently has 3 papers in press, has recently submitted two book chapters and 4 papers to peer reviewed journals, and is currently working on 2 books and 6 papers.

Steve is currently:

- a Fellow of the Linnean Society of London
- a corresponding member of the Botanical Society of America
- a Visiting Professor in the School of Plant

- Biology at the University of Reading,
- a Visiting Professor of Plant Conservation Biology at the University of Western Australia
- a Visiting Senior Research Scholar at Kings Park and Botanic Garden

He is a board member of

- Kew Enterprises
 - the Royal Botanic Gardens Kew Foundation and Friends
 - Botanic Gardens Conservation International
- He is also a Trustee/Governor of the World Wide Fund for Nature

He has been the recipient of several awards including:

- a Fullbright Senior Scholarship to the University of Georgia;
- a Miller Visiting Research Professorship at the University of California, Berkley;
- a CSIRO Visiting Scientists award
- and an Australian National University Visiting Fellowship

In 2003 he was awarded the Commonwealth Centenary Medal for service to community. He was president of Australian Systematic Botany Society for 3 terms from 2002 to 2005.

Stephen is, I am sure you will agree, a most worthy recipient of the Nancy Burbidge Medal. I now invite Stephen to deliver the Nancy Burbidge Lecture: "Old Australian Landscapes Yield New Perspectives on Biodiversity Evolution and Conservation". And having spent some time in the field with Steve, I would not be surprised if these old landscapes had a few granite outcrops scattered across them.

John Clarkson

Nancy Burbidge Lecture

Old Australian landscapes yield new perspectives on biodiversity evolution and conservation

Stephen D. Hopper

Royal Botanic Gardens, Kew, Richmond, Surrey, TW9 3AB United Kingdom
School of Plant Biology, The University of Western Australia,
Crawley, Western Australia 6009

Conventional theory for conservation biology has developed primarily from data on species from young, often-disturbed, fertile landscapes (YODFELs) in the Northern Hemisphere. Old climatically-buffered infertile landscapes (OCBILs) are rare today, but are prominent in the Southwest Australian Floristic Region, South Africa's Greater Cape, Venezuela's Pantepui Highlands and elsewhere in Australia and overseas. They may have been more common globally before Pleistocene glaciations. Here, I explore seven sets of hypotheses derived from

OCBIL theory. Based on the premise that natural selection has favoured limited dispersability of sedentary organisms, OCBILs should have elevated persistence of lineages (Gondwanan Heritage Hypothesis) and long-lived individuals (Ultimate Self Hypothesis), high numbers of localised rare endemics and strongly differentiated population systems. To counter against such natural fragmentation and inbreeding due to small population size, ecological, cytogenetic and genetic mechanisms selected for the retention of heterozygosity should feature (the James

Effect). The climatic stability of OCBILs should be paralleled by persistence of adjacent semi-arid areas, conducive to speciation (Semiarid Cradle Hypothesis). Special nutritional and other biological traits associated with coping with infertile lands should be evident, accentuated in plants through root foraging strategies, unusual symbioses, carnivory and parasitism. The uniquely flat landscapes of southwestern Australia have had prolonged presence of saline palaeoriver systems favouring evolution of accentuated tolerance to salinity. Lastly, unusual resiliences and vulnerabilities might be evident among OCBIL organisms, such as abilities to

persist in small fragmented populations but great susceptibility to major soil disturbances. Although evidence exists to test several of these predictions, much remains to be done before understanding of processes approaches that for the much more common YODFELs on which most people live.

This is the abstract of the lecture presented at the conference in Adelaide. This is presently a work in progress and its place of publication not decided. Its presentation as the Burbidge Lecture will be acknowledged when it is published (Eds).

Eichler Research Fund Report

Diversity and evolution of the mycorrhizal fungi associated with the *Diuris punctata* species complex in Victoria

Zoë F. Smith

Australian Research Centre for Urban Ecology, Royal Botanic Gardens Melbourne
School of Botany, The University of Melbourne, Parkville, Victoria 3010

Orchid seeds lack endosperm and rely on associations with symbiotic mycorrhizal fungi for a supply of simple sugars to assist germination and development of seedlings (Zettler et al. 2003). Australian terrestrial orchids also depend on mycorrhizal fungi for persistence (nutrition) of adult plants and re-emergence after summer dormancy (Brundrett et al. 2003). Understanding of the evolutionary relationships among terrestrial orchids and their associated mycorrhizal fungi is therefore essential for developing successful conservation strategies, particularly for reintroductions. *In vitro* germination and growth of temperate terrestrial orchids, as well as *in situ* establishment of seedlings, is generally more successful when inoculated with a suitable fungal symbiont (Zettler et al 2003). Therefore association with a suitable mycorrhizal fungus is a prerequisite for the successful reintroduction of terrestrial orchid species, as well as further *in situ* seed germination and establishment, an important requirement for self sustaining populations (Zettler and Hofer 1998). Further, identification of the fungi associated with terrestrial orchids planned for reintroduction could provide some knowledge of the potential ecological effects of the introduction of the fungus.

The genus *Diuris* Sm. comprises 56 species in seven morphological groups (Clements 2001). This study focussed on the four Victorian members of the *Diuris punctata* species complex: *D. punctata* Sm., *D. punctata* Sm var. *daltonii* C.Walter, *D. dendrobioides* Fitzg., and the state and federally protected *D. fragrantissima* D.L.Jones & M.A.Clem. (Clements 2001, Jones and Clements 2004). Recent studies have



Fig. 1. Reintroduced *Diuris fragrantissima*, November 2005
Ph. Zoë Smith

confirmed the morphological and molecular distinction between the three taxa and the unwarranted recognition of *D. daltonii* (C. Walter) D.L.Jones & M.A.Clem. as distinct from *D. punctata* at species level (Smith et al. 2007, *in press*). The *D. punctata* species complex is distributed throughout eastern Australia and includes *D. alba*, *D. arenaria*, *D. oporina*, *D. parvipetala*, and *D. tricolor* outside Victoria (Clements 2001, see Smith et al. *in press* for map of geographic ranges). The isolation and culture of a suitable mycorrhizal fungus is one of the major steps in the reintroduction plan for *D. fragrantissima*.

The specific objectives of this research were to determine:

1. What species of fungi are associated with *Diuris* in Victoria?
2. What are the evolutionary relationships between closely related *Diuris* species and their associated mycorrhizal fungi in Victoria?
3. Can a suitable fungus be located for use in reintroductions of *Diuris fragrantissima*?

Identification of fungi from closely related orchid species will determine specificity levels between closely related Victorian *Diuris* species and therefore whether fungi from closely related species have the potential to be used in future reintroductions of *D. fragrantissima*.

Fungi were isolated from root samples collected from the species and populations listed in Table 1, and identified by direct sequencing of the internal transcribed spacer (ITS) and nuclear

Table 1. *Diuris* species and site location from which fungi were isolated in Victoria

Species	Site	Grid Reference
<i>D. punctata</i>	Mornington	38° 13'S, 145° 02' E
	Wooragee	36° 17'S, 146° 43'E
	Bonegilla	36° 08'S, 147° 00' E
	Boorhaman	36° 12'S, 146° 17' E
	Inverleigh	38° 06'S, 144° 03' E
	Munro	37° 55'S, 147° 11'E
<i>D. punctata</i> var. <i>daltonii</i>	Victoria Valley	37° 32'S, 142° 19' E
<i>D. dendrobioides</i>	Bonegilla	36° 08'S, 147° 00' E
	Boorhaman	36° 12'S, 146° 17' E
<i>D. fragrantissima</i>	Tottenham	37° 48'S, 144° 51' E
	Zoo (<i>ex situ</i>)	37° 50'S, 144° 57' E
<i>D. chryseopsis</i>	Rockbank	37° 43'S, 144° 38'E
	Glenrowan	36° 27'S, 146° 13'E
<i>D. sp. aff. chryseopsis</i>	Parwan	37° 42'S, 144° 27'E

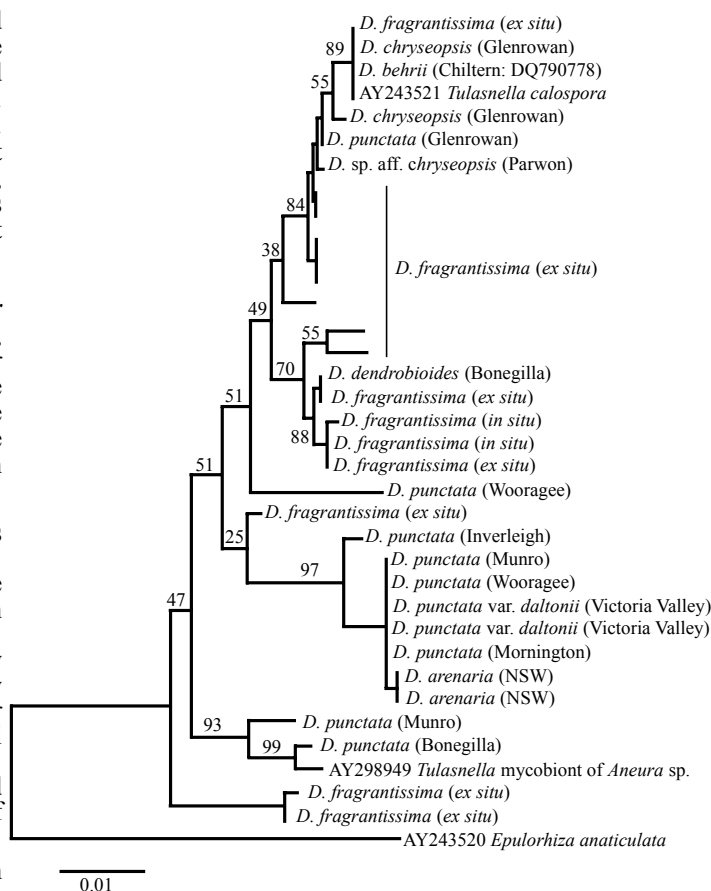


Fig. 2. Neighbour joining tree produced from ITS sequence data. Bootstrap percentages are indicated above branches. Isolates are labelled corresponding to their host species, or accession numbers obtained from Genbank.

large subunit (nLSU) DNA regions. Fungi isolated from *Diuris chryseopsis*, a yellow flowered *Diuris* growing sympatrically with *D. punctata* and forming a sister taxon to the purple flowered *D. punctata* group (Smith et al. 2005), were included for possible outgroup comparison. Mycorrhizal status of isolated fungi was confirmed by their ability to germinate host seed. Seed viability was assessed by asymbiotic germination using nutrient-rich media (Western Orchids Laboratories). Fungi were isolated both from *in situ* and asymbiotically-propagated *ex situ* *D. fragrantissima* plants. Sequences obtained in this study have been deposited in Genbank under accession numbers: DQ790751-DQ790838. Maximum parsimony (MP) analyses were conducted using PAUP 4.0b10 (Swofford 1998) for separate and combined ITS and nLSU datasets including selected closest matches found on Genbank.

Twenty-two fungal isolates with visibly different morphology were selected for germination trials

from *in situ* plants sampled. All fungi had a typical *Rhizoctonia* morphology based on simple microscopic examination (Ma et al. 2003). Nine fungi germinated seed of their host species, hence were mycorrhizal (Table 2). Host seed often showed greater germination percentage with fungal isolates from different species or sites. Less than 30% germination occurred for all species. Asymbiotic germination was consistently lower than symbiotic indicating low seed viability. Fungi isolated from *D. punctata* (Glenrowan) and *D. dendrobioides* (Bonegilla) initiated germination of *D. fragrantissima* seed, indicating that either these species are specific for a particular fungus, but are associated with the same species, or that fungal specificity between these closely related species is low. While fungi isolated from purple-flowered *D. punctata* (Grampians and Glenrowan) and *ex situ* *D. fragrantissima* induced germination in both purple and yellow-flowered *Diuris*, fungi from yellow-flowered *D. chryseopsis* never initiated seed germination in the purple-flowered *Diuris*. Potentially, fungi associated with *D. chryseopsis* are more host-specific than those of the purple-flowered counterparts. Seed of sympatric *D. dendrobioides* and *D. punctata* (Bonegilla) only germinated when inoculated with fungus from either species from the same site, or with fungus from *ex situ* *D. fragrantissima*. *Diuris punctata* from other sites showed no distinct pattern in germination, except that fungi from the host species were capable of inducing seed germination. Isolates from *ex situ* *D. fragrantissima* induced seed germination of all sampled *Diuris* species, generally to a far greater extent than other isolates. The origin of fungi associated with *ex situ* *D. fragrantissima* is uncertain. Potentially, wild-collected *D. fragrantissima* plants salvaged from development sites in the 1970s have retained mycorrhizal fungi in cultivation, which have further spread to asymbiotically propagated plants housed together. Two isolates were recovered from *in situ* *D. fragrantissima*, and both of these initiated germination of host seed. Mean percentage germination was 16.4% (isolate 1, standard error = 1.17) and 52.1% (isolate 2, standard error = 3.03). Mean germination on asymbiotic media was 40.9% (standard error = 2.67). Percentage

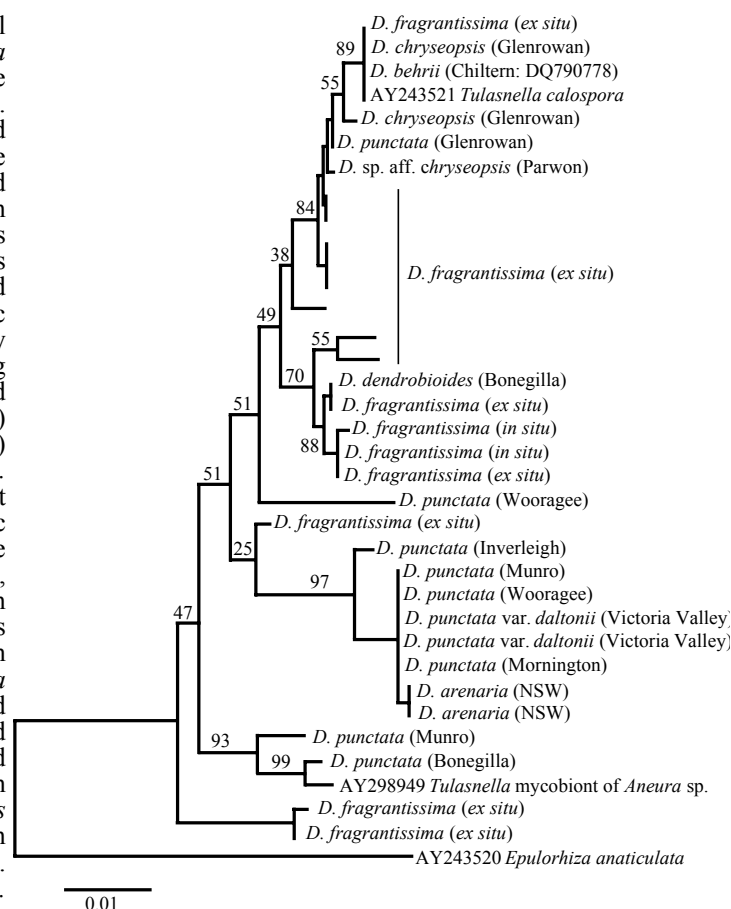


Fig. 3. Neighbour joining tree produced from nLSU sequence data. Bootstrap percentages are indicated above branches. Isolates are labelled corresponding to their host species, or accession numbers obtained from Genbank.

germination of orchid seed varied significantly ($p < 0.05$) among replicates inoculated with the same fungal isolate, indicating that cultured fungal isolates that fail to induce germination of host orchid seed may not necessarily be non-mycorrhizal.

The close relationship between species in the *Diuris punctata* species complex (Smith et al. 2005) was reflected in the mycorrhizal relationships, with all fungi isolated from Victorian *Diuris* species showing at least 94% similarity in ITS and nLSU gene regions to *Tulasnella calospora*. All fungi isolated in this study formed a monophyletic clade with 100% bootstrap support from ITS sequence data (Fig. 2). *Tulasnella danica* formed the sister taxon of the major clade, and *T. pruinosa*, *T. violea* and *Talbida* clustered separately. One *Epulorhiza* (the anamorphic (asexual) form/life stage of teleomorphic (sexual) stage *Tulasnella*) and six *Tulasnella* isolates from Genbank, grouped within the main clade. nLSU sequence data produced

Table 2. Germination (%) of host orchid seed and standard errors (in parentheses) when inoculated with fungal isolates from different *Diuris* species and populations.

Host seed	<i>D. fragrantissima</i> ex situ	<i>D. punctata</i> Munro	<i>D. punctata</i> Mornington	<i>D. punctata</i> var. <i>daltonii</i> Victoria Valley	<i>D. punctata</i> Bonegilla	<i>D. dendrobioides</i> Bonegilla	<i>D. chryseopsis</i> Glenrowan
Fungus source							
<i>D. fragrantissima</i> ex situ	14.92 (5.24)	4.90 (2.30)	14.10 (6.32)	1.27 (0.51)	9.25 (4.13)	5.75 (3.01)	14.10 (4.16)
<i>D. punctata</i> Munro	0	0	9.38 (6.21)	18.07(11.02)	0	0	0
<i>D. punctata</i> Mornington	0	1.00 (0.75)	5.32 (4.28)	11.33 (6.25)	0	0	0
<i>D. punctata</i> var. <i>daltonii</i> Victoria Valley	0	0.33 (0.15)	2.63 (2.40)	0.73 (1.20)	0	0	0.40 (0.25)
<i>D. punctata</i> Bonegilla	0	0	0	0	4.17 (1.19)	2.00 (1.53)	0
<i>D. punctata</i> Glenrowan	8.67 (4.93)	1.00 (0.08)	0	1.33 (1.20)	0	0	2.19 (2.02)
<i>D. dendrobioides</i> Bonegilla	10.00 (7.20)	0	0	0	1.15 (0.99)	3.01 (1.61)	0
<i>D. chryseopsis</i> Glenrowan	0	0	0	0	0	0	11.31 (7.26)
<i>D. chryseopsis</i> Parwan	0	0	0	0	0	0	3.49 (1.59)

a largely congruent tree with lower bootstrap support (Fig. 3). The similarity of isolates obtained from all species indicates a low level of mycorrhizal specificity that contrasts with high levels of specificity observed in other terrestrial Australian orchids (e.g. Ramsay et al. 1986, Batty et al. 2002). Analysis of combined datasets was also conducted but provided no further resolution of taxa and is not shown.

Phylogenetic vs. mycorrhizal relationships

Fungi that induced germination of *D. fragrantissima* seed in this study clustered genetically with isolates from *in situ* and *ex situ* *D. fragrantissima* and yellow flowered *Diuris*. However, formation of mycorrhizal association, as indicated by seed germination, was not always reflected in the phylogram, e.g. isolates from yellow flowered *Diuris* did not induce germination of purple flowered *Diuris* *in vitro*. The phylogram may be more indicative of potential specificity between orchid species and fungi, since conditions may not be optimal for germination *in vitro*, and *in vitro* specificity is known to be different to *in situ* (Batty et al. 2001). The close relationship among all isolates in this study suggests that all isolates have the potential to germinate *D. fragrantissima* seed given optimal environmental conditions.

Isolates obtained from yellow flowered *Diuris* clustered more closely to each other than to isolates from purple flowered *Diuris*, indicating

a level of taxonomic specificity of mycorrhizal associations. Furthermore, this shows a potential radiation of orchid species resulting from utilization of slightly different fungi. However, one isolate from the purple flowered *D. punctata* that was growing sympatrically with yellow flowered *D. chryseopsis* at Glenrowan clustered closely with isolates from yellow flowered *Diuris*, indicating a shared mycorrhizal symbiont and suggesting that the associated fungi were more specific to habitat or geographic area than to particular host taxa. Previous studies have shown that both geographic and taxonomic influences can act on fungal usage and specificity (e.g. Hollick et al. 2005). Taylor and Bruns (1999) found that mycorrhizal fungal strain was influenced by geography and/or habitat as well as source species in the nonphotosynthetic orchids *Corallorhiza maculata* and *C. mertensiana*.

In both the ITS and nLSU phylograms, most of the *Diuris punctata* fungi formed a sub-group with strong support (BS=95), including fungi from *D. punctata* var. *daltonii* and two fungal isolates from *D. arenaria*. This is consistent with *D. punctata* var. *daltonii* clustering within *D. punctata* based on morphological and molecular data (Smith et al. 2007, *in press*). Further, the fungus isolated from *D. dendrobioides* (Bonegilla) was more genetically similar to fungi from *in situ* *Diuris fragrantissima* than fungi from sympatric *D. punctata* (Bonegilla), reflecting relationships among the host orchid species (Smith et al. 2007, *in press*). *Diuris dendrobioides* occurs in

the North East of Victoria and its range extends north into NSW, while the known range of *D. fragrantissima* is confined to the Western Basalt Plains Grasslands in southern Victoria. *Diuris punctata* is relatively common, occurring broadly across the state. Therefore, the shared symbiont and close relationships between *D. dendrobioides* and *D. fragrantissima* cannot be explained by geographic proximity. It is unknown whether the species' ranges extended further historically. Two identical isolates from *ex situ* *Diuris fragrantissima* plants, including one from a wild collected plant and one from an asymbiotically propagated plant, formed a separate group within the major clade (BS=100) with 65% bootstrap support for the *Epulorhiza* sp. from Genbank as sister taxon.

Some of the differences found between phylograms produced from ITS and nLSU datasets, and the assumptions that could be made from either, highlight the usefulness of analysing more than one gene region for mycorrhizal investigations. For example, the slight variation between the two sequences from isolates from *in situ* *D. fragrantissima* plants, which had identical ITS sequences, the *D. dendrobioides* isolate nLSU sequence was identical to an *ex situ* *D. fragrantissima* isolate, and *D. punctata* isolates from four plant populations had identical nLSU sequences while the *D. punctata* protocorm isolate was different, contrasting with the ITS phylogeny.

Implications for reintroductions of *D. fragrantissima*

Isolates from *D. punctata* sampled from a broad range of populations across Victoria were genetically closely related. Therefore fungi associated with *Diuris* in Victoria can be found across an extensive geographic area, and potentially from a broad range of habitats. Although not highly specific for certain isolates, the genus *Diuris* appears to be specific to a narrow taxonomic group of *Tulasnella* species in Victoria. While *in vitro* specificity does not necessarily reflect *in situ* specificity (Batty et al. 2001), high levels of genetic similarity found between fungal isolates of *D. fragrantissima* and its close relatives *D. punctata* and *D. dendrobioides*, indicates that that mycorrhizal fungi for reintroduction can be obtained from a closely related host species, in that seed germination *in vitro* reflects mycorrhizal relationships that could form *in situ*. Further, fungi isolated from *ex situ* *D. fragrantissima* had 98% similar ITS DNA regions to isolates from *in situ* plants. Therefore, it is likely that fungi reintroduced with host *D. fragrantissima* plants are suitable for reintroduction with adult plants and will be capable of inducing seed germination *in situ* post-reintroduction.

Regardless of their close genetic relationships, only three fungal isolates from related *Diuris* species were capable of inducing germination of *D. fragrantissima* seed *in vitro*. Different fungal strains might require different environmental conditions to form mycorrhiza. Further, statistically significant germination percentages were recorded for seed inoculated with the same fungal isolate in different Petri dishes. A single fungal symbiont is commonly used in the development of *ex situ* collections of terrestrial orchids (e.g. Zettler et al. 2005), but for successful reintroductions into field sites where suitable fungi are not known to exist, a range of fungal strains might increase plant survival and further recruitment via seed germination *in situ*. The presence of different fungal strains might increase the success of reintroductions through the ability to exploit different microhabitats in the variable environment of recipient sites. Fungal succession throughout an orchid's life cycle has been reported for a few orchid species. For example, *Gastrodia elata* forms associations with different fungal species for initiation of seed germination and as an adult plant (Zettler et al. 2003). Fungi isolated from adult *D. fragrantissima* plants were capable of germinating seed in this study, but this might not be the case for other terrestrial orchids.

Blast searches with nLSU sequences found a close match (96%) between isolates from *D. punctata* and *ex situ* *D. fragrantissima*, and a *Tulasnella* mycobiont of the leafy liverwort *Aneura pinguis* (Metzgeriales). The reintroduction of associated species, such as liverworts and yellow flowered *Diuris* with that of *D. fragrantissima* may enhance mycorrhizal relationships and pollinator visitation. *Tulasnella calospora* has been isolated from *Pinus banksiana* ectomycorrhizas in Canada (Warcup and Talbot 1967), and may partake in tripartite relationships, involving the transfer of photosynthates from tree species to orchids via the associated mycobiont (Weiss et al. 2004). This type of relationship has previously been discovered in achlorophyllous orchids (e.g. Taylor and Bruns 1997, Selosse et al. 2004). Investigations into the survival of fungi post-reintroduction, and further *in situ* seed germination is recommended.

Postscript

This research was presented at the 5th International Conference on Mycorrhiza, Granada, Spain, in July 2006 and the 18th World Orchid Conference, Dijon, France, March 2005 (Fig. 4). Isolated fungi have been used in reintroductions and are being used to propagate plants for future reintroductions at the Royal Botanic Gardens Melbourne, as part of the Banksia Award winning project "Back from the brink – saving Victoria's threatened orchids" (Department of Sustainability and Environment, Victoria).

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Fig. 4. The conference was held in Granada, Spain. This shows the inside the Alhambra, a 13th century Nasrid Dynasty palace that was once the residence of the Muslim kings of Granada and their court.

Ph. Zoë Smith



Articles

Exhibiting the history of The University of Melbourne Herbarium (MELU)

Nicole Middleton
Collections Manager

The University of Melbourne Herbarium

Friday 19th September saw the official opening of the exhibition *Sowing a Seed: Art Inspired by the Herbarium* by Professor Warren Bebbington (Pro Vice-Chancellor - Global Relations) and Associate Professor Andrew Drinnan (Director - MELU). Curated by Nicole Middleton (Collections Manager - MELU), *Sowing a Seed* showcases the artistic and scientific collections of University of Melbourne Herbarium (e.g. Figs. 1, 2) with supporting items from other University and private collections. The exhibition combines a scientific museum demonstration with an artistic gallery exposé to present various links between art and science in botany over the last four centuries.

Sowing a Seed: Art Inspired by the Herbarium is open from 15th September to 23rd November 2008 in the Baillieu Library, University of Melbourne. For opening times and further information see Web ref. 1. The following is an excerpt from the exhibition catalogue (Middleton & Chai, 2008).

A short history of the University of Melbourne Herbarium (MELU)

The history of the herbarium at the University of Melbourne can be described in two parts — before and after its official designation as MELU in 1974.

Pre-MELU¹

It begins at the very beginning of the University of Melbourne — with one of the four foundation professors, Frederick McCoy, professor of natural science (1855-1899), whose broad intellectual territory included botany, zoology and geology. Amid great local controversy, McCoy convinced the Victorian government to allow the transfer of the colony's geological and zoological collections from the Assay Office in Melbourne to his honorary curatorial care at the University in 1856. Victoria's embryonic National Museum in the new north wing of the University Quadrangle also included herbarium specimens — a collection of Victorian specimens from the government herbarium established by the government botanist, Dr Ferdinand Mueller.

While developing a taxonomically-arranged botanic garden (later known as the System Garden) in the north-west corner of the University

grounds and teaching botany to Bachelor of Arts and Bachelor of Medicine students, McCoy developed the University herbarium, receiving more Australian specimens from Mueller and other specimens from overseas sources. With the establishment of the Bachelor of Science degree in 1887, the new professor of biology, Walter Baldwin Spencer, taught botany.

In 1906 Dr Alfred J. Ewart, the University's first professor of botany (1906-1937), took over botany teaching in a small extension to Baldwin Spencer's biology building. For his first 15 professorial years Ewart was also the government botanist and thereby in charge of the government herbarium collections in Victoria's National Herbarium. Initially he spent his mornings in the National Herbarium in the Domain and his afternoons at the University.

Anxious to re-establish the National Herbarium's taxonomic authority, Ewart encouraged the deposition and documentation of specimens there and arranged for young Ethel McLennan and other members of his tiny University department to undertake the taxonomic work. In one of his many attempts to spark consideration of rationalising his two positions by bringing them together — at either the University or the National Herbarium



Fig. 1. *Papaver* sp. (Poppy) plant model manufactured by Les fils d'Émile Deyrolle, Paris, France, c.1900. University of Melbourne Herbarium.
Ph. Provided by Nicole Middleton

¹This section is based on Gillbank (2007).

— Ewart incorporated University herbarium collections into the National Herbarium in 1907.

As the number of University botany students and courses increased, so did the proportion of Ewart's time spent at the University. In 1921 he became a full-time professor, leaving Victoria again without a government botanist, and Ewart without direct access to the National Herbarium collections.

In 1925 Ewart received a huge herbarium which is widely accepted as the foundation collection of the University of Melbourne Herbarium. While beginning to focus his botanical attention on orchids, the Reverend Herman M.R. Rupp offered the non-orchid part of his extensive herbarium to his old college, Trinity, whose warden suggested that it would be more useful at the University, which lacked a herbarium. Accepting this 'first large donation' of several thousand specimens, Professor Ewart reportedly commented: 'Until now there has been practically no herbarium at the University'. The wooden cupboards built to house Rupp's generous donation must have occupied a substantial space in Ewart's cramped quarters.

In 1929 Ewart's department could at last expand into its own new building, appropriately situated on the edge of the System Garden, and Ewart could develop the University Herbarium. Staff and students contributed, including Drs Ethel McLennan and Reuben Patton and their mycology and systematic botany students, who submitted herbarium specimens as part of their coursework. Patton trained a teenage assistant, Edward J. Sonenberg, to collect plants. Sonenberg accompanied class excursions, collected specimens for Patton's systematic botany classes, looked after the University Herbarium and helped Ewart prepare the much-needed *Flora of Victoria* book.

The University agreed to Ewart's request for herbarium help, but only on an honorary basis. Herbert B. Williamson, a retired school teacher whom Ewart considered 'our leading systematist in Victoria', was appointed in 1929 and died in 1931, just before the publication of Ewart's *Flora of Victoria*. In its preface Ewart acknowledged Williamson's taxonomic contributions while Honorary Keeper of the University Herbarium. Two years later Ewart found a suitable successor — William H. Nicholls, another accomplished, modest, amateur naturalist. Nicholls walked and cycled far in search of plants, and carried out beautifully-illustrated taxonomic work on Australian orchids. Meanwhile Sonenberg continued the day-to-day care of the Herbarium.

Following Ewart's death in 1937 Dr John S. Turner became the University's second professor



Fig. 2. Textile Designer Nicole Cerini, demonstrating development of her fabric designs from herbarium specimens such as *Sticherus lobatus*.
Ph. Provided by Nicole Middleton

of botany and plant physiology (1938-1973). Turner supported the development of regional reference collections in the University Herbarium, including one established in association with post-war ecological work he facilitated on the Bogong High Plains. The Bogong High Plains collection was initiated by Associate Professor McLennan's assistant, Sophie Ducker, with some help from James (Jim) Willis from the National Herbarium.

Sonenberg continued contributing to and curating the University Herbarium collection, but without an official curator or keeper, and Dr David Ashton began to contribute specimens from the kaleidoscope of Victorian ecosystems. But for the persistent support of McLennan, Sonenberg, Ducker and Ashton, the Herbarium may well have languished and been reduced to only teaching collections of Victorian species.

In the 1960s, Ducker, Ashton and his fellow-ecologist, Dr Raymond Specht, encouraged their postgraduate students to deposit voucher specimens in the Herbarium, and used the collections for undergraduate teaching. Enriched with specimens and respect, the Herbarium gained a new lease of life under a new curator. Following her retirement as associate professor, McLennan was appointed part-time (but salaried) Keeper of the Herbarium in 1957. She began the important but onerous task of accessioning the entire collection and updating the nomenclature.

Both McLennan and Sonenberg continued at the Herbarium until 1972. Sonenberg's collections are particularly important because they include specimens from areas since overtaken by suburbia. In 1974, the year after Professor Turner retired, the University Herbarium was listed as MELU in *Index Herbariorum*, the global directory of herbaria. Its significance was now officially recognised.

MELU²

The botanical systematist Dr Suzanne Duigan succeeded McLennan as Keeper of the Herbarium, with Ian Clarke as Collections Manager. Clarke added substantially to the MELU collections and used his access to the specimens to produce *Name That Flower*, a basic plant identification text that was reissued as recently as 2006, nearly 20 years after its first publication.

Towards the end of the 1980s the specimen collection had expanded beyond the capacity of the wooden cupboards used to store the Herbarium in 1926. Upon taking up the roles of Herbarium Director and Collections Manager respectively in 1989, Professor Pauline Ladiges and Karen Wilson began the huge task of relocating the Herbarium and its cupboards to a new site within the School of Botany's Natural Philosophy Building. In 1991 the Herbarium was officially opened in its new location, with an entire room designated to the conservation and preservation of the collection. A large compactus with ample storage space for the ever-expanding collection was placed between the beautiful old wooden cupboards.

From the mid-1980s the Herbarium was actively used for both research and teaching. As in Specht's time during the 1960s, from the mid-1980s undergraduate students were taught how to produce herbarium specimens as a means of learning plant identification and herbarium techniques. This tradition has continued for the past 20 years with well-prepared herbarium specimen assignments being added to the collection. Today Collections Manager Nicole Middleton and Herbarium Assistant Kathy Vohs provide training sessions both in the Herbarium and in the plant science laboratories, teaching students the details of specimen identification, preparation and conservation. With large class numbers and numerous field trips, non-archival folders of herbarium specimens, known as 'field herbaria', have been produced for students to take on excursions as a resource to assist in learning.

In 1998 Director of the Herbarium Associate Professor Andrew Drinnan and Middleton became the Herbarium's management team. Middleton introduced some substantial changes

into the Herbarium. To provide students with the opportunity to learn about herbarium techniques and management, she started the Herbarium Extracurricular/Volunteer Work Experience Program. Little advertising is required for the program, which to date has taken on 131 volunteers and inspired many students into careers in plant sciences and roles at other herbaria.

In 2002 Middleton began designing a database to electronically catalogue the Herbarium collection. In 2003 she supervised a group of information systems students who developed a database specifically for the Herbarium's needs — specimen recording, data retrieval, multiple search facility, label printing, image digitisation capabilities, and with the ability to exchange data with other Australian herbaria. Once it comprehensively covers the MELU collection, the database will be linked to the Australian Virtual Herbarium (<http://www.anbg.gov.au/avh>).

Most of the data entry has been done by volunteers and casual staff employed with the help of small grants from the University Cultural Collections and the Russell and Mab Grimwade Miegunyah Fund. With only 7,751 (8%) specimens databased, it is estimated it will take another 66 years to finish databasing the entire collection, by which time it may be too late to use the information on the herbarium labels to help save many of the endangered species represented in the Herbarium. Funding is urgently required to complete the Herbarium databasing project, making the priceless specimens and their information accessible to scientists and the public via the internet.

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- Ian Clarke wrote a history of the MELU Herbarium for the ASBS History conference and later publication – we have added that reference here. It would be good to have some of the other histories from that conference updated since there has been much more research into many of them (Eds).*

²This section is based on Middleton (2007).

News

Adelaide ASBS Conference

While we haven't managed to persuade anyone to write an account of the Adelaide conference at this stage, we hope that someone will do so for the next issue of the Newsletter. The organising committee would like to thank all of those who attended, but particularly those who presented papers or posters and chaired sessions. Kevin Thiele's presentation of the Lucid Workshop deserves special mention – even though he was unwell, Kevin still presented a great workshop and those who attended have all been very complimentary. Steve Hopper is thanked for not only delivering the Burbidge lecture and a public lecture, but also for being coopted, along with Jenny Barker, into helping to re-arrange the furniture and fetching and carrying for the welcome and registration function. Others we would like to thank are Tim Entwisle and Bob Hill for their chairing of the discussion sessions, Bob Baldock for organising the field trip, David and Judy Symon for their poetry rendition at the dinner, and those of you who contributed photos for the dinner entertainment. Special mention must be made of Jeremy Bruhl for his unique contributions in the absence of a physical presence.

We hope that you enjoyed yourselves and as well as being mentally stimulated you were able to return refreshed to your work-place.

And for the record, the ASBS Pauline Ladiges student prize was awarded to Trevor Wilson for his presentation on pollination in *Prostanthera* (Lamiaceae).

Science Show and taxonomy

The crisis in taxonomy received an airing on the Science Show in August when Ryonen Butcher (Western Australian Herbarium) was interviewed by Robyn Williams. The transcript of the talk can be downloaded from the website.

Web site: www.abc.net.au/rn/scienceshow/stories/2008/2329277.htm

Tough time ahead for universities

Unprecedented staff cuts are being made at Australian, and particularly Victorian Universities. 270 staff are to be cut from Victoria University, 180 from La Trobe and 15 from the arts faculty of The University of Melbourne. The losses stem from diminishing returns from investments and reduced government funding with government funding not expected to be increased until at least 2010.

Unpopular courses are also being cut as universities focus on more popular courses with the expectation that extra funding, if/when it does come, will be tied to performance, specific missions and more student choice.

Returns from endowments across the sector are expected to fall by 71%, and the Group of Eight universities, with their large endowments, are expected to suffer the most.

[From *The Australian* on October 22nd 2008, accessible at www.theaustralian.news.com.au/story/0,25197,24531026-12332,00.html]

Herbarium weed profiles

The weeds project undertaken by herbaria last year has been completed for some time now. 435 profiles were provided by herbarium staff and contractors and those profiles are now all accessible on the Commonwealth Government website.

Web site: www.weeds.gov.au

Kew's Millenium Seed Bank in need of ongoing funding

Funding of the Millenium Seed Bank is under threat. While there is enough funding to keep it open until the end of 2009 ongoing funding has not been forthcoming and more than £100 million is needed for the seed bank to reach its 2020 target. The current economic climate may well make it more difficult to raise the funds needed.

An account of this threat to the continuation of the project appeared in *The Times* on October 3, 2008 (Web ref.).

Web ref. www.timesonline.co.uk/tol/news/environment/article4870690.ece

Evidence for first appearance of eucaryotes and cyanobacteria reassessed

The earliest fossil evidence for eukaryotes and cyanobacteria has now reverted to 1.78–1.68 and 2.15 billion years ago respectively since it has been shown that the biomarkers extracted from 2.7 billion year old shales in the Pilbara Craton, Australia, were not indigenous to the rocks containing them.

Reference

Rasmussen, B., Fletcher, I.R., Brocks, J.J. & Kilburn M.R. (23 October 2008). Reassessing the first appearance of eukaryotes and cyanobacteria. *Nature* 455, 1101-1104 doi:10.1038/nature07381

Fungimap Conference V

The Fungimap conference (web ref. 1) will be held from Thursday 21st May to Tuesday 26th May, 2009. It has been organised in conjunction with the Sydney Fungal Studies Group and will be held at Black Gold Country Cabins, Wallerawang (near Lithgow) in the Blue Mountains region of NSW. These dates will allow members to attend the Australasian Mycological Society (Web ref. 2) meeting in New Zealand from Sun 10th to Sat 16th May.

Web references

Web ref. 1: www.rbg.vic.gov.au/fungimap/_welcome/
Web ref. 2: <http://bugs.bio.usyd.edu.au/AustMycolSoc/Home/ams.html>

Zoologists considering electronic publication

As with Botanical Code the Zoological Code requires publication in a durable medium. The zoologists are considering an amendment to the

Code that will permit electronic publication of new names and nomenclatural acts. A draft of the amendment has been published in ZooTaxa, and on the ICZN website and there will now be a year-long period for community input.

The published draft can be downloaded from: the ICZN website (Web ref. 1) or the Zootaxa website (Web ref. 2). The summary points are:

- Electronic-only publications should be allowed if mechanisms can be found that give reasonable assurance of the long-term accessibility of the information they contain.
- Some method of registration should be part of the mechanism of allowing electronic publication of names and nomenclatural acts.
- Physical works that are not paper-based (e.g. CD-ROMs, DVDs) should be disallowed.

Web references

Web ref. 1: www.iczn.org
Web ref. 2: <http://www.mapress.com/zootaxa/>

[From Taxacom Archives]

Death notices

Dr Roger Foster Black (1923–2008)

Roger Black, born in Spalding, South Australia on 21st April 1923, died in Adelaide on 10th October 2008. Roger, schooled in Adelaide, was trained during the war years as an electrical engineer for the Royal Australian Air Force.

After the war he began a Science degree at Adelaide University which was completed at Sydney University where he majored in Botany and undertook Honours and finally a Ph.D. in the uptake of salt by saltbush. Roger was then employed for a time in the mid 50s by CSIRO at Griffith, before moving to Queensland in 1959 to work with the Department of Primary Industry. There were later short stints in Adelaide (c. 1969) and Darwin before Roger shifted to Western Australia in the early 1970s. Here he worked for many years with consultants, Dames & Moore, in the rehabilitation of mining sites. As a result of this work he did have some contact with the Western Australian Herbarium.

He returned to Adelaide in 2003 working as a volunteer at the State Herbarium from October 2004 until shortly before his death. One of his main tasks was to sort the large Western Australian *Eremophila* collection in AD into botanical groups.

His own collections were not many: there are 182 in PERTH, collected between 1974 and 1977, with a further c. 10 Solanaceae specimens of this same period being found in AD. All appear to be unicates.

Roger was the grandson of J.M. Black and was the proud owner of a number of his grandfather's botanical relics which have been on display in the Botanic Gardens and State Herbarium Library for the last 18 months.

Thanks to Roger Black's family for supplying the eulogy from which this information was mostly taken, Graham Bell for information about Roger's volunteer activities at AD and to Neville Marchant and Juliet Wege for supplying information about Roger's involvement with the Western Australian Herbarium (Eds).

Ding Hou (1921–2008)

It is with great regret that we have to announce the death of our beloved colleague, Dr. Ding Hou (11 October 1921, Hsingkan, Jiangxi, China). He had been ill for some time and died on 9 September 2008, in the hospital in Leiden.

Ding was best known for his very important revisions of Anacardiaceae, Anisophylleaceae, Aristolochiaceae, Celastraceae, Rhizophoraceae, and Thymelaeaceae of SE Asia. Lately he was revising some genera of the Leguminosae. He published 105 new taxa or combinations in these families and is himself commemorated in *Aristolochia dinghoui* Favio González & O. Poncy (Aristolochiaceae), *Parishia dinghouiana* Kochummen (Anacardiaceae), and *Thottea dinghoui* K. Swarupanandan (Aristolochiaceae).

Arriving in 1956, he was until recently in his amiable, quiet, and modest way an important staff

member of the Rijksherbarium, now National Herbarium of The Netherlands, Leiden, even working on after his retirement. He was always willing to discuss taxonomic problems and was an invaluable help in translating Chinese texts. He will be greatly missed.

For a more extensive biography, bibliography, portrait, see Baas & Adema and Lut, *Blumea* 46 (2001) 201--205.

Eric Smets
Director Hortus Botanicus Leiden and the National
Herbarium of the Netherlands

Conference reports

The following articles represent the reports on the series of discussions on publishing and teaching systematics held at the 2008 annual meeting of ASBS held at the University of Adelaide. These

discussions developed from some of the questions raised in the last issue of the Newsletter.

Eds.

An analysis and a vision for the publishing of plant and fungal taxonomy in Australia¹

Tom W. May

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The session on 'Publishing systematics' at the recent Australian Systematic Botany Society Conference in Adelaide (1 October 2008) provided a useful forum for discussing a range of issues around the publication of systematics and taxonomy in Australia. In this article I will focus on one particular aspect of alpha-taxonomy, which is the formal publication of taxonomic descriptions. I would like to encourage strategic consideration of novel and integrated arrangements for delivering taxonomic descriptions and nomenclatural information, especially through linking the initial formal publication with the aggregation of descriptive and nomenclatural information. A key suggestion is the creation of a single on-line Australian journal of taxonomic botany; but other less-centralised visions also merit consideration.

As a background to presenting a new model for publishing alpha taxonomy, information is provided on the current publication of novel Australian plants and fungi and some trends that may affect this (particularly Impact Factor). The term 'plants and fungi' is used for convenience, but the discussion is relevant to all the diverse organisms traditionally studied in herbaria, including lichens, bryophytes and algae.

Impact Factor

There has been increased emphasis in grant and performance assessment on measures of how often individual journal articles are cited by other journal articles, and on the Impact Factor (IF) of the journals in which articles appear. This emphasis has arisen in higher education institutions, but is now spreading through the broad research community, including herbaria. The IF is also widely used by publishers for

measuring journal performance and selling journals.

One widely utilised source of citation statistics comes from the ISI *Web of Knowledge* (Web ref. 1). ISI provides *Journal Citation Reports*, which are annual tables of statistics for journals, including the Impact Factor. Journals must satisfy certain criteria in order to be included ('ISI listed') in the *Journal Citation Reports*. There is pressure, particularly on researchers in universities, to only publish in ISI-listed journals. Herbarium journals around the world are responding to this pressure by seeking ISI listing, and this trend is already being followed by at least one Australian herbarium journal. There is also a trend for the 'internationalisation' of journals that were previously regional or clearly identified with particular herbaria. Examples are the recent re-badging of *Botanical Journal of Scotland* as *Plant Ecology and Diversity*, and the creation of *Systematics and Biodiversity* to supersede various journals formerly published by the Natural History Museum, London.

The Impact Factor (IF) is a widely used measure of the average number of times papers published in a particular journal are cited. The IF of a given journal for a given year is calculated from the total citations in that year to papers published in the journal in the preceding two years, divided by the number of paper published in the journal in those two years. Thus the impact factor for 2007 is derived from the number of cites in that year to papers published in 2005 and 2006. For convenience, I refer to citations that count towards the IF as those in the two-year 'impact factor window'. Although data are provided in the ISI *Web of Knowledge* on citations of articles in a wide range of journals and other publications,

¹ Although I have had a long and rewarding involvement with the editorial committees of *Australasian Mycologist*, *Australian Systematic Botany*, *Muelleria* and *The Victorian Naturalist*, the views expressed in this article are my own and do not necessarily reflect those of the publishing institutions or organisations of these journals.

the only citations that count towards IF are those that are in journals that are themselves ISI listed. Thus citation by a paper in *Muelleria* (not ISI listed) of a paper in *Australian Systematic Botany* (ISI listed) would not count towards the IF of the latter journal.

Taxonomic papers may be utilised frequently by consumers of taxonomy, such as those using them to key out material, but such usage is not reflected in IF, although it may result in high numbers of downloads where journals are available in electronic form. Proposals to increase the citation of taxonomic publications, such as that put forward by Seifert *et al.* (2008) are to be applauded, but will not have much affect on the IF of taxonomic journals because the journals that have many taxonomic papers in them are likely to have a low impact factor mainly because there are few citations within the two-year window that is used to calculate IF. Taxonomic papers can continue to be cited for many decades after publication, but once the two-year impact factor window has passed, none of these citations contribute towards IF.

Impact Factor can be a rather crude measure of the quality of individual articles in a journal because it smooths out the considerable variation in citation among articles, and in any case citation is not the only measure of quality. Nevertheless, IF is widely used by journal publishers, journal purchasers and funding providers and its significant influence must be taken into account.

Where is taxonomy published?

In order to establish where novel species (and infraspecific taxa) of vascular plants (excluding fossils) were described from Australia in the period 2001–2007, an analysis was undertaken

Text box 1. Australian 'herbarium journals' (associated herbaria in parentheses)

Austrobaileya (BRI)
The Beagle (NT)
Journal of the Adelaide Botanic Gardens (AD)
Kanunnah (HO)
Muelleria (MEL)
Nuytsia (PERTH)
Telopea (NSW)

of information provided in the *Australian Plant Name Index* (Web ref. 2) (Fig. 1). For each of the 1742 novel taxa, the place of publication was assigned to one of the following categories:

- Australian herbarium journals (see Text box 1)
- *Australian Systematic Botany*
- Orchid journals (specifically *Australian Orchid Research*, *Australian Orchid Review* and *The Orchadian*)
- Other overseas journals (such as *Blumea* and *Systematic Botany*)
- Other Australian journals (such as *Western Australian Naturalist* and *Proceedings of the Linnean Society of New South Wales*)
- *Flora of Australia*
- Other books

There was considerable variation in the number of new taxa published from one year to the next, but in all years a significant proportion of the novel taxa were published in Australian herbarium journals (Fig. 2). Over the eight years, 56.5% of the new species appeared in the herbarium journals, and a further 18.3% in *Australian Systematic Botany*, with these two categories accounting for about three-quarters of the novel taxa. The *Flora of Australia* series and a single book (published in Australia) accounted for 10.8% of the novel taxa. Two of the orchid journals were

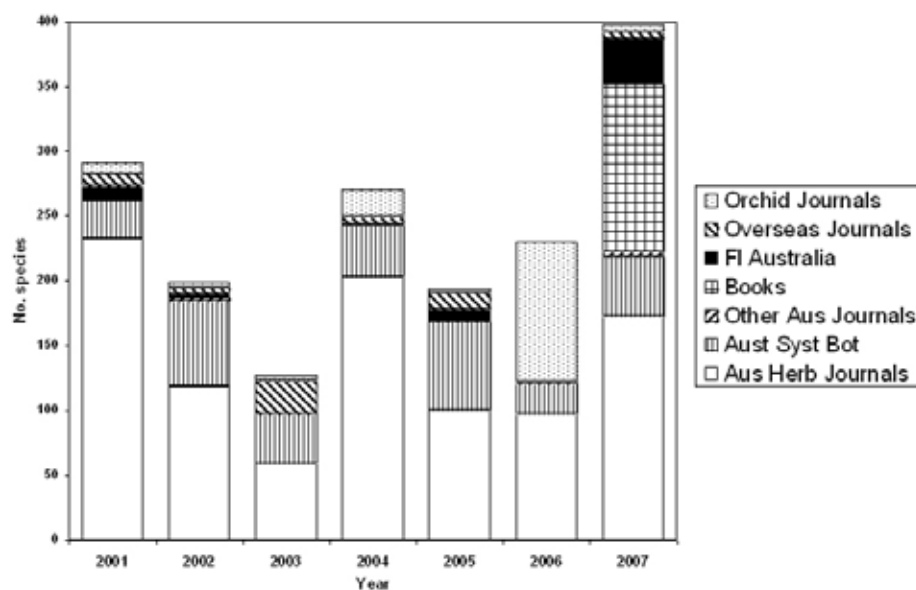


Fig. 1. Place of publication of new species of Australian vascular plants (from APNI).

published in Australia, and these two journals accounted for 6.3% of the novel taxa. Across the categories, some 93% of the novel taxa appeared in journals and books published in Australia.

For macrofungi, data on the place of publication were taken from the *Interactive Catalogue of Australian Macrofungi* (Web ref. 3) for the period 1994–2003 (utilising the underlying database held at MEL, not the web interface). The same categories were utilised as for the analysis of plant names, with the addition of *Australasian Mycologist* (Fig. 3). Among the 318 new taxa, only 4.7% appeared in Australian herbarium journals, but about half (46.9%) were published in *Australian Systematic Botany*. No new taxa appeared in the *Fungi of Australia* series, but one book (published in Australia) accounted for a further 34.1% of novel taxa. Across the categories, some 86% of the novel taxa appeared in journals and books published in Australia.

These analyses show that a significant proportion of the new taxa of Australian vascular plants and macrofungi appear in a relatively small range of journals and books published in Australia. It is likely that a similar situation pertains to novel taxa of other groups of organisms studied in herbaria, such as algae, lichens and bryophytes.

Taxonomy in *Australian Systematic Botany*

Australian Systematic Botany (Web ref. 4) is one of the Australian Journals of Scientific Research published by CSIRO Publishing with the endorsement of CSIRO and the Australian Academy of Science. It is an international journal that publishes high-quality original research. Recent issues of the journal contain a

mix of review articles, revisions of genera and biogeographic and phylogenetic studies, for all groups of algae, fungi (including lichens) and plants (including bryophytes). The scope of *ASB* now excludes papers which deal with groups of unrelated species or with single new species (unless there is significant new information of broader interest).

There are a number of trends in scholarly publishing worldwide that are influencing decisions about the mode of publishing and scope of journals such as *ASB*. These trends include (1) the advent of the Open Access model for journal publishing, where authors rather than subscribers pay, (2) the very high proportion of electronic content in scholarly publishing, (3) the internationalisation of journals, and (4) the increased importance of citation measures.

Impact Factor, in particular (as discussed above), poses some important questions for a journal such as *ASB* because of the likelihood that alpha taxonomic papers do not cite highly. An analysis of the 88 papers published in *ASB* during the period 2004–2006 inclusive using the cited reference search in the *ISI Web of Knowledge* (Web ref. 1) shows that the 34 papers that contain descriptions of new taxa at species level or below have less citations contributing to IF (i.e. citations in the 'impact factor window') than the other papers that do not contain novelties. Papers with alpha taxonomy have on average 0.94 citations in the impact factor window, compared to a mean of 2.70 citations for other papers. [The direct contribution to the IF is half these figures, because papers published in a given year contribute to two IFs, the IF for the year after, and the IF for the year after that.] The citation rate of the other

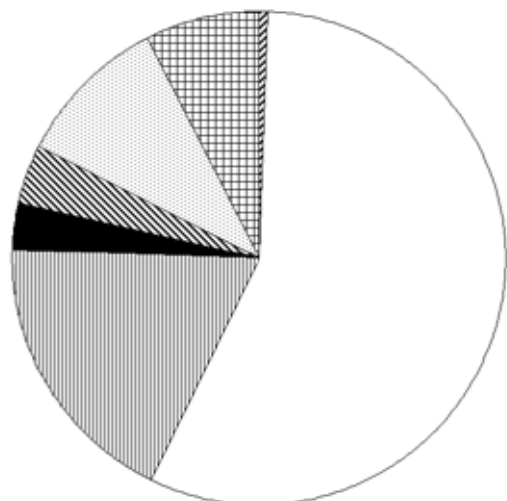


Fig. 2. Place of publication of new species of Australian vascular plants (2001–2007). n=1742. Legend same as for Fig. 1.

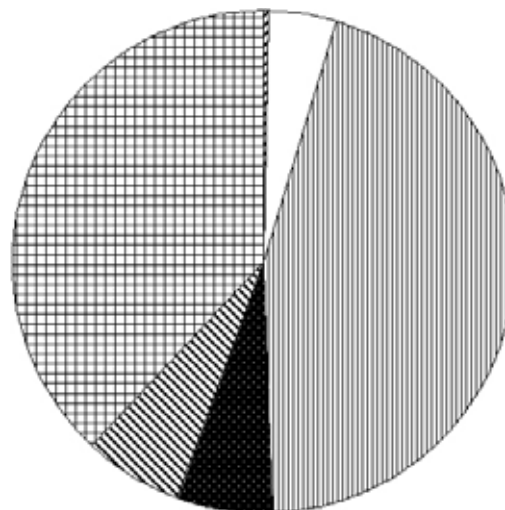


Fig. 3. Place of publication of new species of Australian macrofungi (1994–2003) n=318. Legend same as for Fig. 1 with addition of *Australasian Mycologist* (white dots on black background).

papers category is boosted by some highly citing review articles, but even when such articles are removed from calculations, the average citation for other papers is still higher (1.50) than that for alpha taxonomic papers (0.94). In addition, across all papers, there are more (50.0%) alpha-taxonomic papers with no citations at all in the impact factor window, compared to 18.5% zero-citing papers among the other papers.

The division of papers into alpha-taxonomic and other is rather crude, in that the alpha-taxonomic papers range from descriptions of novel taxa with no accompanying analysis, to sophisticated morphometric or phylogenetic analyses in support of the newly described taxa. There are also some papers in the 'other' category that are not analytical, but happen not to contain novel taxa. Nevertheless, this analysis confirms anecdotal views that alpha taxonomic papers do not cite as well as papers in other areas of systematics.

Given the pressures related to Impact Factor, it is inevitable that editorial boards and journal publishers will need to consider the scope of journals in relation to alpha taxonomic papers. A change in scope will need to be based on clear measures of the quality and relevance of manuscripts, rather than a simple knee-jerk exclusion of papers that describe new species. If less alpha-taxonomy does end up being published in *Australian Systematic Botany*, at least some manuscripts are likely to be re-directed by authors towards herbarium journals (for plants) and *Australasian Mycologist* (for fungi).

Herbarium journals

With the exception of CANB, all 'state botanical herbaria' in Australia publish an in-house botanical journal (*Austrobaileya*, *Journal of the Adelaide Botanic Gardens*, *Muelleria*, *Nuytsia* and *Telopea*), or the organisation in which the herbarium is housed publishes a journal of wider scope, that includes botany (*Kanunnah* and *The Beagle*).

The most significant advantage of in-house publication of the herbarium journals appears to be the financial value of the journals as exchange for similar publications from other institutions, in Australia and overseas. Other advantages of in-house publication are (1) potentially rapid turn around of manuscripts (although see below under challenges), (2) ability to co-ordinate production of illustrations by in-house artists, and (3) value to the host institution as evidence of research activity to government and sponsors. Another positive feature about herbarium journals that emerged during discussions in the Publishing systematics session at the ASBS Conference is that they can provide an enhanced sense of collegiality among those within an institution who are involved with the production of the journal.

Challenges for Herbarium journals

There are some existing and emerging challenges for the herbarium journals. Firstly, publication has been very irregular over the last decade for all journals (and it is particularly relevant that regularity of publication is one of the criteria by which journals are assessed for ISI listing). There have sometimes been hiatuses of several years between issues, or multiple issues have been published in a given year. This has been due to a combination of an irregular flow in the submission of articles and periods when institutional resources have not been available to produce issues on time.

The majority of papers in the herbarium journals have taxonomic novelties, and so a second challenge is to recruit, train and support the specialised editing expertise that is required to publish alpha taxonomy. The editors and editorial boards are usually all staff of the institution that publishes the journal. Significant staff time is devoted to producing herbarium journals, both in arranging refereeing and liaising with authors, but also in layout, copy editing and production. There are plenty of new species of plants and fungi yet to be formally described, but there has been a decline in the proportion of staff in Australian herbaria carrying out alpha-taxonomy. Therefore, more efficient arrangements for publishing taxonomy as far as personnel are well worth considering.

A third challenge, and perhaps the most significant in the current context, is the provision of electronic submission and content. *Australian Systematic Botany* has an electronic submission and review system and all current and back issues (including those of *Brunonia*) are available electronically (to subscribers). This level of electronic input and access is the standard for international systematics journals. In contrast, none of the Australian herbarium journals have automated electronic submission and review systems (although individual papers would

Text box 2. Nomenclatural and descriptive data cut and pasted from the on-line version of Cranfield, R.J. (2004) *Grevillea bipinnatifida* subsp. *pagna* (Proteaceae), a new subspecies from southwest Western Australia. *Nuytsia* 15: 187–192 (www.dec.wa.gov.au/images/stories/nature/science/nuytsia/15/2/187-192.pdf)

Grevillea bipinnatifida subsp. *pagna* Cranfield, subsp. nov.

A *Grevillea bipinnatifida* subsp. *bipinnatifida*
foliorum lobis ultimis lateralibus angustioribus statim dignoscenda.

Typus: 6.5 km NNW of Waroona, Western Australia, 5 October 1999, R.J. Cranfield 14220 (*holo*: PERTH 05344301; *iso*: CANB).

Shrub to 0.70 m high, lignotuberosus...

Text box 3. The information in Text box 1, with the addition of publication details, along with tags to differentiate different pieces of information. These data are now suitable to be automatically read into a database. Format, such as bold and italics, has been ignored. The names of tags are provided as examples only and do not necessarily conform to international standards.

```
<genus>Grevillea</genus>
<species>bipinnatifida</species>
<infra_rank>subsp.</infra_rank>
<infra_name>pagna</infra_name>
<author>Cranfield</author>
<novelty>subsp. nov.</novelty>
<journal>Nuytsia</journal>
<journal_volume>15</journal_volume>
<journal_page>190</journal_page>
<year>2004</year>
<Latin_diagnosis>A Grevillea bipinnatifida subsp. bipinnatifida foliorum lobis ultimis lateralibus
angustioribus statim dignoscenda</Latin_diagnosis>
<type_citation>6.5 km NNW of Waroona, Western Australia, 5 October 1999, R.J. Cranfield 14220 (holo:
PERTH 05344301; iso: CANB)</type_citation>
<description_1>Shrub to 0.70 m high, lignotuberous ... ..</description_1>
```

almost all be submitted as electronic documents by email).

The availability of electronic content varies considerably across the herbarium journals. There does not appear to be any on-line content for *Austrobaileya*, *Journal of the Adelaide Botanic Gardens*, *Kanunnah* or *Muelleria*. Selected back issues of *The Beagle* are available electronically, but these do not include any botanical papers. *Telopea* (Web ref. 5) has back issues on-line from 1997 to 2007 available as pdfs, but not the current issue, although the intention is to make this available. For *Nuytsia* (Web ref. 6), the current issue is available on-line, as are back issues from 2004, and there is an active program to digitise older issues (K. Thiele pers. comm.). [For *Australasian Mycologist* (where most new macrofungi are being published), a pdf of a text version of each issue is available for 1996–2006 (Web ref. 7). For *Australasian Lichenology* (in which many of the novel Australian lichens are being published) a pdf of a text version of each issue is available for 2006–2008 (Web ref. 8).]

None of the Australian herbarium journals are currently ISI listed. Citation of articles in Australian herbarium journals is extremely low by journals that are ISI listed. An analysis of citations in the impact factor window to the 236 papers published in Australian Herbarium journals for the period 2004–2006 found that most (87%) articles are not cited at all, and the average number of citations per article is 0.19. If a particular herbarium journal was ISI listed, the number of citations to that journal could increase because of cross citation from articles in the same journal, and if additional herbarium journals were ISI listed, cross citation among journals could further contribute to citations. It is also quite possible that the IF of *Australian Systematic Botany* could be improved by ISI listing of some or all of the Australian herbarium journals, because of citations of recent papers in

ASB by articles in herbarium journals. However, any increase in citation of Australian herbarium journals provided by ISI listing is likely to be small in the context of the impact factors of leading international systematics journals, particularly due to the herbarium journals containing almost exclusively alpha taxonomic papers.

The absence of electronic content for some herbarium journals, and the lack of ISI listing for all herbarium journals is an important contributing factor to the lack of citations for papers from these journals, within and beyond the impact factor window. Those without electronic content simply do not exist in the electronic space that scholars are increasingly restricting their reading to. Users that work within the electronic space circumscribed by the ISI *Web of Knowledge* are just not aware of the existence of the herbarium journals. We are fortunate in our herbarium libraries that we have ready access to original copies of journals extending back several hundred years, but many researchers in universities today totally utilise digital sources for publications. It is desirable that papers in which new species are described are accessible to as many researchers as possible (not just other taxonomists).

Transferring and formatting electronic content

It is important to distinguish electronic content that is merely an image of the printed page and that which is digital text—both can be presented in format such as pdf, but only the latter can be cut and pasted, such as into databases. Some current on-line versions of journals are merely images of the printed page but the on-line versions of *Australian Systematic Botany*, *Nuytsia* and *Telopea* are true electronic text. An example of digital content, as can be cut and pasted from the on-line version of *Nuytsia*, is given in Text box 2. A marked up version of this text is provided in Text box 3 (as an example only, and with the tags not necessarily confirming to any standard field

names). If tags are placed around the original electronic content, as can be done if the content is placed into a template in the first place prior to publication, then the data can be automatically exported to a database.

Electronic publication

Under the current (Vienna) *International Code of Botanical Nomenclature* (Web ref. 9), publishing of new names is not effective in electronic media. Names that appear in on-line journals that have a print version are effective from the date of the print version. Some journals, such as *Australian Systematic Botany*, ensure that the on-line version does not appear until after the print version is distributed. However, it is quite likely that some new names are being introduced in on-line versions that appear prior to print versions. As more and more journals provide electronic content, some confusion is inevitable between print and electronic versions. Already, at least one journal (*Persoonia*) has adopted the rather messy arrangement (as far as a librarian would be concerned) of printing individual articles simultaneously with the appearance of an on-line version, and distributing these print versions at various dates during the year to selected herbarium libraries, as well as making available a bound version of the journal twice a year.

The issue of electronic publishing under the ICBN will no doubt be debated vigorously at the next International Botanical Conference in Melbourne in 2011, and it is to be hoped that a solution is presented that is in line with the very wide adoption of electronic publishing by the general research community. In the meantime, any electronic journal that publishes botanical novelties will need to print sufficient paper copies simultaneously with the electronic version, and lodge these in libraries. This means that publication as one or more issues per year remains the most practical arrangement. Once electronic publication becomes effective under the Code, individual papers could be published electronically as soon as they have passed through the review and editing process.

The lack of being able to effectively publish new botanical names in electronic media is certainly no reason to retard efforts to create new on-line taxonomic journals.

Current models for publishing and aggregating nomenclatural and taxonomic data

The present model of publishing new species and assembling descriptive information about taxa has been well established for more than 150 years. Descriptions of new species mainly appear in short papers, or sometimes in longer monographs, which can also include revisions of existing taxa. Floras are prepared on a geographic basis,

at regional (state and territory) and continental level (*Algae of Australia*, *Flora of Australia* and *Fungi of Australia*), and have more concise descriptions than usual for monographs. Floras are published infrequently, often taking one to several decades to complete. For vascular plants, there will eventually be almost total duplication of taxa between the *Flora of Australia* and state and regional floras, and there is also considerable duplication between adjacent state floras. In contrast, for non-vascular plants and algae and fungi, there is often a complete lack of 'flora' treatments at the state level, and a patchy coverage at the continental level.

In recent times, some states have been making available electronic versions of state floras. These may be exact replicas of the print versions, or have newly created content. Some volumes of *Flora of Australia* are now available electronically (Web ref. 10), but these are no more than the exact text of existing volumes converted to electronic form, with the species names in keys hyperlinked to the relevant descriptive text. In some families, numerous taxa have been described since the appearance of the print volumes of *Flora of Australia*.

In contrast to descriptive data, the majority of nomenclatural information is available on-line, with new content generated almost exclusively electronically, at least at the national level. Basic nomenclatural data includes name, place of publication and so on and this is often combined in databases with basic taxonomic information (such as synonymy) and sometimes also citation of type specimen data. Nomenclatural coverage for vascular plant is very good, through the *Australian Plant Name Index*, and there are also various plant lists maintained for states and territories (some on-line, some only paper-based). Some states have begun to accept nomenclatural data from APNI, rather than re-key the same data in their own databases. This appears to be the approach taken by the New South Wales PlantNet (Web ref. 11), where citation details for plant names are provided through a link to APNI.

On-line databases that include nomenclatural information for non-vascular plants and algae and fungi include the Checklist of Australian Liverworts and Hornworts (last updated 2006), the Census of Freshwater Algae in Australia, the Australian Marine Algal Name Index (AMANI) the Interactive Catalogue of Australian Fungi (ICAF, with only partial coverage and last updated 2005), and the Checklist of the Lichens of Australia and its Island Territories. These various databases (for all, see Web ref. 10) are not all actively updated, and some do not yet cover all taxa. There do not appear to be any comprehensive on-line catalogues for non-

vascular plants, algae or fungi at the state and territory level, although individual species may be included in on-line resources such as the Western Australian FloraBase (Web ref. 12), and the national lists may include state distribution.

Two phases of flora production

Given that much data are now in electronic format, it is time to reconsider how taxonomic data are aggregated. Constraints that existed for printed versions of floras may not exist where publication is electronic. An example is the need to reduce the length of flora descriptions to a maximum number of words.

It is useful to consider the creation of floras as a two stage process. The first phase is the simple bringing together of available descriptions of the taxa that occur in an area. The second phase is the critical evaluation of species boundaries (through a revision, if necessary) and the integration of various sources of descriptive data (including from examination of specimens collected since the species was described). If descriptions of new species were in an electronic format to begin with, then it is a simple matter to use these descriptions as a first phase flora, with no additional editing. This is particularly useful for groups such as fungi, where there are very few modern flora treatments, and a slow rate of production of second phase treatments, especially in relation to the magnitude of the diversity in the group.

One objection that has been raised to automatic inclusion of descriptive information in regional or state-based floras is that the plants of a widespread species that grow in the particular area may show a restricted range of the total variation of the species. It would be interesting to know how often this occurs, but at a first pass it is not particularly misleading. In any case, many of the species currently being described are known from few populations in a narrow geographic range from one state or territory, and hence the issue of tailoring descriptions to regional floras is not an issue. Any significant variation at state or regional level can be referred to in discussion under the species. For the fungi and algae the tailoring of descriptions for state floras is simply not an issue because (1) any compilation of descriptions is better than nothing, and (2) species in these groups tend to be more widespread, but lack regional variants.

Perhaps more important for floras, when viewed as tools for users, is concise information on the most distinctive features of a species, and the possible look-alikes. This is information that authors of new names could be encouraged to include as a separate paragraph when introducing new taxa, with the explicit intention of it being utilised in on-line floras.

A vision for an on-line Australian journal of plant and fungal taxonomy

Creation of an on-line journal of Australian plant and fungal taxonomy would address a number of the challenges faced by individual herbarium journals and for the publishing of taxonomy in general. A fully on-line journal (with electronic submission and content) also opens up exciting possibilities for direct output of taxonomic and nomenclatural content to electronic databases for descriptions (on-line floras) and nomenclatural information (such as APNI).

Such a journal could be created by pooling the resources of several or all of the institutions currently engaged in publishing hard copy journals. It would not be necessary to cease publication of the existing journals, but the more institutions that were involved in an on-line journal, the greater the benefits in terms of economy of scale. The greatest potential for gains is in the layout and production phase.

A key feature of an on-line taxonomic journal would be the use of templates in which authors would place the information that is currently provided in standard taxonomic papers. Such templates would allow seamless transfer of nomenclatural and descriptive data to other databases. If the use of templates proves successful, it may be that the rationale for the introduction of new taxa, such as through morphometric or other analysis, is published in the international scientific journals (with their high impact factors) while the taxonomic descriptions themselves are published separately in the on-line format. It is conceivable that each novel species becomes a separate publication.

Templates for electronic data

An on-line journal that has an electronic submission procedure should utilise templates for nomenclatural and descriptive data, so that this data could be readily imported into a variety of databases (Fig. 4). The templates would be available as on-line forms into which the text that is standard for taxonomic novelties could be entered. There would also need to be a facility to enter the general introductory material, discussion and references that wrap around the formal taxonomic descriptions. Development of such templates and the system to allow them to be used on-line would seem to fall well within the scope of the current *Atlas of Living Australia* project (Web ref. 13), being essential infrastructure for the 'biodiversity data management system' which is the mission of the ALA.

At present, nomenclatural data (author, place of publication etc.) and type citation data (holotype collection information from the protologue) appears to be re-typed into various state and national databases. With an on-line journal,

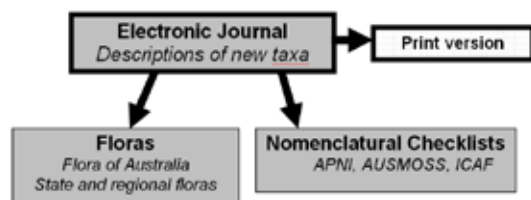


Fig. 4. A model for publishing an on-line journal for Australian plant and fungal taxonomy, with output to nomenclatural databases and floras (and a print version as long as needed).

and suitable templates, the 'raw' data from protologues could be made available immediately new names were published. For each issue, the journal could generate an electronic report that contained the material from the templates, along with the publication data from the particular issue (data, page number etc.) in a format such as XML, and this could be provided to relevant databases, or simply downloaded from the journal website.

It would be important at first that the template for each new species was simple and easy for the publishing author to use. For nomenclatural information, a dozen or so fields might be used to cover such information as: genus / species / infrageneric rank / infrageneric name / author / place of publication / page / data / holotype citation (compare Text box 3). Managers of nomenclatural databases could add further information if they wish, but having the basic protologue data available electronically would be a boon for database managers. This is especially so for groups apart from vascular plants, where there are currently many less resources allocated to keeping nomenclatural databases up-to-date, and where not all databases currently include the full range of protologue information (especially the full citation of the holotype specimen). As the system develops, feedback between the journal and the database managers would no doubt refine the process.

For descriptive data, there does not appear to be much direct usage of descriptions appearing in protologues in on-line floras. Where paper-based flora treatments are being actively produced, this may not matter, because the descriptions from these can be used for electronic floras. However, given the very long lead times in completing floras, and the lack of active compilation of floras for some regions, there is a great advantage to be able to automatically export electronic descriptive information into on-line floras, both nationally and for states and territories that maintain electronic floras. As with nomenclatural information, there is a particular advantage for non-vascular plants and fungi, where there is often no modern flora treatment available in any format. Aggregation of electronic versions of descriptions of new species is a very simple way of creating a first pass flora, when the second pass flora (that would be based

on revisionary work) may be decades or more away from completion.

For descriptive data, it would be particularly important not to make the template too complicated. At first, a few fields could be provided for (1) the Latin diagnosis or description, (2) the description (perhaps broken up into a couple of fields, as for example for fungi: *macrocharacters*, *microcharacters*, and *cultural characters*), and (3) some fields for the standard paragraphs that accompany descriptions of novel taxa such as *specimens examined*, *etymology*, *conservation status*, *habitat*, *distribution* and *discussion*. There would be scope in future for descriptions to become atomised (so that descriptive data could then be automatically used for databases that underlie identification tools such as interactive keys). For the moment, however, it would be best to take the layout as currently used in print journals and provide a simple template into which that data can be entered.

For both descriptive and nomenclatural information, there has been extensive work on developing various standards for structuring data and naming fields (Web Ref. 14) and such standards should be utilised wherever possible.

In addition to allowing export of nomenclatural and taxonomic data, a template for authors to submit their taxonomic novelties would also have the advantage that formatting of the text (font, paragraph layout and so on) could be readily imposed by the on-line journal. It is obvious from talking to current journal editors that adherence to instructions for formatting manuscripts is often patchy, and this is complicated by the lack of consistency in format across various journals that publish taxonomic papers. With the original data available electronically, and by using a mark-up language such as through XML, a variety of output formats are readily achieved.

Even with an on-line journal that takes up papers from many of the existing publications where Australian taxonomic novelties occur, some new species will be published elsewhere. Development of templates for the on-line publication of novelties could assist in trapping data from species published elsewhere, if authors are encouraged to submit data from their other publications. Such a system already exists for fungi through Mycobank, which is capturing publication data and the Latin diagnosis and original description for fungal names worldwide, by encouraging authors to submit this information. It is extremely worthwhile considering how regional, national and international initiatives in this area could dovetail so as to produce maximum capture of nomenclatural and descriptive information, and a minimum of re-entering data in different databases.

Models for electronic publishing

Before an on-line Australian journal for plant and fungal taxonomy could be created, some significant challenges around copyright, ownership and library journal exchanges would need to be addressed. The economics of publishing such a journal would need to take into account the costs and benefits of various models to the creators of taxonomy and the consumers of taxonomy (particularly libraries) and also the role of institutions and funding agencies in supporting the publishing of taxonomy. Costs may be shifted between creators and consumers, but the net cost to institutions could well remain the same, or be less due to the economies of scale from aggregation of existing journals, should that take place.

In regard to copyright, there should not be any insurmountable problems about assigning copyright as far as reproduction of descriptive and nomenclatural information in a centralised database, given that nearly all new species of Australian plants are described by botanists who are employed by state or commonwealth agencies.

As for ownership, financial and other issues, rather than discuss in detail all the ramifications, one of many possible models for an on-line electronic journal is suggested in Text box 4 (as a starting point for discussion):

Development of a suitable and financially sustainable model will need input all stakeholders, the most important of which appear to be the Council of Heads of Australian Herbaria, the Australian Biological Resources Study, the Atlas of Living Australia, and relevant professional societies such as the Australian Systematic Botany Society and the Australasian Mycological Society. At the Adelaide ASBS meeting, the possibility of an on-line taxonomic journal was referred in the first instance to CHAH for further consideration. An annual meeting of the editors of the Australian herbarium journals would be another useful forum to further discussions about on-line publication of taxonomic novelties (as well as being a useful exercise in itself for a range of matters).

Conclusion

The International Botanical Conference in Melbourne in 2011 is an ideal opportunity to showcase developments in the publishing and dissemination of taxonomy by launching an on-line journal for Australian plant and fungal taxonomy, that is integrated with nomenclatural and descriptive databases. Simplicity of vision in the first instance will be a key factor in delivering a working electronic journal, as will

Text box 4. A model for an on-line Australian journal for plant and fungal taxonomy

The journal is owned by the Council of Heads of Australian Herbaria. There is an editorial board made up of representatives of all herbaria; this board handles review and acceptance of manuscripts. A production manager is employed by the journal. The journal is open access, with a charge for authors to publish in the journal, either per paper, or per species. However, on-line access to the journal for current and back issues is completely free. The archive is searchable (allowing searches for sets of papers that deal with particular families or with taxa from particular states). The journal is ISI listed. Download statistics for individual papers are provided. On submission, authors agree to copyright being assigned to the journal. Nomenclatural and descriptive data are provided on the journal website in a format that can be tailored for download of particular subsets to other databases. In tandem with establishment of the journal, CHAH coordinates an assessment of taxonomic journal holdings across Australian herbaria, enabling rationalisation of low-use journals so that subscription is ceased or they are held by one designated institution. Sufficient paper copies of the journal are printed to comply with the Code, as several regular issues per year, and can be used for exchange. Additional copies for exchange are printed only if this is financially advantageous. There is flexibility in producing the print version that allows for special issues that aggregate papers relevant to particular states, taxa or funding agencies (providing the paper copy in the Minister's hand that is a desirable event for managers of herbaria).

be a willingness for all the stakeholders to work together for a mutually rewarding outcome.

Acknowledgement

Thanks to Robyn Barker for her encouragement to attend the Adelaide ASBS Conference and Tim Entwistle for his deft chairing of the Publishing systematics session which allowed a wide-ranging and stimulating discussion of the topic.

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- Web ref. 2. Australian Plant Name Index. <http://www.anbg.gov.au/cpbr/databases/apni.html>
- Web ref. 3. Interactive Catalogue of Australian Fungi. http://www.rbg.vic.gov.au/research_and_conservation/fungi/cat
- Web ref. 4. Australian Systematic Botany. <http://www.publish.csiro.au/nid/150.htm>
- Web ref. 5. Telopea. <http://plantnet.rbgsyd.nsw.gov.au/Telopea/>
- Web ref. 6. Nuytsia. <http://www.dec.wa.gov.au/science-and-research/publications-and-resources/nuytsia.html>
- Web ref. 7. Australasian Mycologist. <http://bugs.bio.usyd.edu.au/AustMycolSoc/Home/ams.html>
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- <http://www.anbg.gov.au/abrs/lichenlist/introduction.html>
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- Web ref. 13. Atlas of Living Australia. <http://www.ala.org.au/>
- Web ref. 14. Biodiversity Information Standards. <http://www.tdwg.org/>

One thing that has not been mentioned is the CHAH sponsored workshop "Towards a common approach to Australasian electronic Floras" which a number of people at the meeting attended and which should be mentioned since it covers some of the same ground. It was reported on briefly in Newsletter 133 but the meeting report can be found at

http://hiscom.chah.org.au/wiki/HISCOM/CHAH_Workshop:_Towards_a_common_approach_to_Australasian_Electronic_Floras

Eds.

Publishing systematics discussion session

Tim Entwisle

Botanic Gardens Trust, Sydney

The session was introduced with a few examples of changes and innovations in scientific publication. The recent ranking of journals is controversial, and it is likely to skew publication towards journals with 'A+' rankings rather than the appropriate audience for the paper. In the longer term, such rankings may also skew science and other fields themselves towards disciplines that rank highly rather than those in most need of study (see Web ref. 1). Appropriate citation of taxonomic discoveries is an issue. Some systematists (e.g. Siefert et al., 2008) advocate a system where authors are directed, or strongly encouraged, to cite explicitly at least a few of the sources for the names and sequences they use. Finally, it is worth noting that open access journals are growing in stature, and book shops are moving into 'print on demand' (Angus & Robertson will have 10,000 titles available within 18 months: Web ref 2).

Presentations by Tom May (see earlier), John Conran (see 'abstract') and Juliet Wege (see abstract) were followed by an enthusiastic discussion on the future of plant systematics and taxonomy publishing in Australia. The two major issues were electronic publication and aggregating the 'house' journals – these two threads are interwoven through the following notes, as they were in the discussion. [The names in brackets are those who made major contributions to the discussion point. Undoubtedly the names of some valuable contributors will have been omitted, for which I apologise. Karen Wilson very kindly took notes from the session but all misrepresentations, in accuracies and gross generalisations are mine.]

Improving the electronic management and entry of data is a high priority. For the *Flora of Australia On-line*, the software for Fauna allowing specialists to enter and extract data on-line will

be adapted soon for Flora. The *Flora* will soon be linked to the *Australian Plant Name Index*, including automated alerts when new names are described. (Helen Thompson)

The (almost) entirely on-line journal *Zootaxa* (Web ref. 3) was mentioned. Apparently the reviewing and quality control is similar to other mainstream journals. However apparently some zoologists have concerns about the quality of electronic publication in their field. *Zootaxa* does produce a few hard copies, as does the electronic mycological journal *Persoonia* - the latter to meet the requirements of the ICBN (Judy West, Tom May, Kelly Shepherd)

Some editors are expecting referees to copy edit and do far more than provide a scientific critique of the submission. This varies from journal to journal. (Annette Wilson)

Some smaller journals are desperate for papers and there is a concern this may compromise standards. Papers in these journals often require a lot of extra work by editors and referees. (Juergen Kellerman)

Systematics journals tend to have lower rejection rates than many other journals, due mostly to the nature of the content they publish (a high proportion of papers with fairly standard format and content). Rejection rate is a criterion sometimes used to assess the quality of journals (the more the better). (Tim Entwisle)

We should look seriously at amalgamating the 'house' systematics journals in some way. The reasons organisations continue to publish their own journals include receipt of other journals in exchange, capacity building, control of standards and flagship for the organisation or State/Territory. Exchange is often cited as an issue but with electronic publication this will become less relevant. There is also a view that at least some of the journals we receive on exchange are not worth

¹ John was unable to be present because of illness, but his abstract was read out.

the indirect cost. (Kevin Thiele, Tim Entwisle, Bill Barker)

To get thing started we could make sure everyone has at least a pdf of their journal on the web. It would be better still to have a consistent template for papers describing new species, with at least the major chunks for the description broken up separately. There is some relevance here to the work of the Taxonomic Data Working Group but that is atomising data at a finer level. (Tom May).

There was a conference held earlier this year on open access publishing, with free on-line journal software now available for submission through to publication. This kind of publishing can sometimes shift the costs to the author, and that might be something a funding body like ABRIS takes into consideration. (Annette Wilson, Tom May)

One thing to watch with streamlining the publication of new taxa is to find ways to encourage context setting – e.g. new species should not be published without somewhere relating them back to the overall classification of the next most inclusive taxon. Editorial policy can be tightened to make sure this happens. (Tim Entwisle, David Cantrill)

Users sometimes think an electronic journal is less valuable than a hard copy one, but that will surely change over time. It was suggested we take a straw poll to see who would be happy to see their house journal switch to electronic only with a few hard copies to satisfy the ICBN. Some said they would definitely miss the hard copy. It was pointed out that the real question was ‘what was the trade off’ – i.e. even if we liked hard copy, what would we get for going electronic that might make it better for authors, readers and publishers. (Kevin Thiele, Tim Entwisle)

Another concern with electronic publishing is the sometimes low quality of illustrations. (Kristina Lemson)

ISI listing is difficult for systematics journals. The journal must be issued regularly and not just when sufficient papers are available. If the journals were aggregated in some way this would help with regularity. (Mike Crisp, Tom May)

The editorship of any aggregated journal would have to be shared. It would be important to involve representatives from each State and Territory, particularly for a taxon exclusively or predominantly in one particular region. (Tom May, Tim Entwisle)

An interim step to creating an aggregated journal would be to firstly have all journals on-line, secondly have consistent formats for submission and publishing, and thirdly created a common interface. For any final amalgamation, it

may be best for a few journals to merge in the first instance and then others join them later. Branding for each jurisdiction will be important – it shouldn’t be constraint, just something that is taken into consideration when creating the final product. The presentation and acknowledgement of data could be a little like Australia’s Virtual Herbarium, although that has a quite different basis (collections data rather than scientific publication). It would be best to eventually have the journals linked in some way to the Atlas of Living Australia. (Tim Entwisle, Hannah McPherson, Tom May)

If primarily electronic we should at least in the short term have some capacity for producing hardcopy (in addition to IBCN requirements), perhaps as print on demand. (Helen Thompson)

Impact Factor will always disadvantage systematists due to the long ‘half life’ of our papers, but it is a reality particularly in universities. If we get some of our journals listed by ISI, they will probably draw papers away from other journals. Even if we get a combined/aggregated journal listing our work will seldom have a high impact factor. The actual impact may be high but it just isn’t caught by the system – as a community we need to lobby for the importance of journals and papers with high impact but low impact factors. One measure we might promote is download numbers. (Tim Entwisle, Tom May)

Access to electronic journals varies between organisations but we should assume it will improve. Similarly, although electronic publications (and databases) not counted in many performance assessments, this must change. Even outside electronic publication there is a bias against certain kinds of publication, such as books and conference proceedings. (Kristina Lemson, Gill Brown, Graham Bell, Judy West, Karen Wilson)

The problem of authors of names not being formally cited was raised. Mention was made of the Seifert *et al.* (2008) system mentioned in my introduction. We should encourage authors to make sure critical systematics/taxonomic papers are cited, and that editors support this approach – although accepted that it is difficult/impossible to ‘demand’ a particular kind of citation. Managing journal ethics is important. (Mike Crisp, Tim Entwisle, Chrissen Gemmill, David Cantrill)

It was noted that young scientists seldom get guidance or training on refereeing. It was suggested a workshop be held at the next conference and/or guidelines prepared to help new referees (Gill Brown)

The (pink) booklet listing Australian taxonomists and their specialities was praised. A new version will be produced soon by the Taxonomy Research

& Information Network (TRIN). (Juergen Kellerman, Judy West)

Summing up

1. Participants agreed we should work towards an aggregated national journal for the publication of systematics research, and in particular the description of new taxa. Due to various constraints (e.g. jurisdiction, funding support, promotion, journal exchange), this should be an evolutionary rather than revolutionary process but should begin immediately.
2. All journals should be on-line as soon as possible.
3. There should be a consistent format for submission and publishing as soon as possible.
4. A common interface for all journals should be created as soon as possible.
5. The Nomenclatural Committee of the ICBN should be lobbied to allow electronic publication as the primary means of publishing new taxa as soon as possible.
6. The Council of Heads of Australian Herbaria should take responsibility for leading these actions. It would be appropriate that once a timeline and responsibilities have been established, this is reported back to the ASBS membership through this newsletter.
7. A separate discussion thread continues to explore the issues raised here, and to make sure our journal(s) are at the cutting edge of information delivery.

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Web ref. 3: Zootaxa. A megajournal for zoological taxonomists in the world. www.mapress.com/zootaxa/

Zootaxa and its achievements

Zootaxa, a megajournal for zoological taxonomists in the world, was mentioned in the *Publishing systematics* discussion and it is certainly generating a lot of comment, particularly for its high citation factor. Interesting therefore that its Impact Factor for 2007 is cited as 0.691 (in contrast for example to that of *Australian Systematic Botany* of 0.981 for the same period). The reference below is to an interview with the founder of the journal and provides some insights into how the journal operates. Further information can be seen on their website.

Web site. <http://sciencewatch.com/inter/jou/pdf/08aug-jou-Zoo.pdf>
Eds.

Citation, citation, citation: choosing the best journal real estate

John G. Conran
The University of Adelaide

There is an ever increasing perception by granting bodies, promotions boards and staff managers at universities and other research-oriented institutes that research 'quality' is measured by the citation ratings of both the authors and the journals in which their research is published. In general, however, many plant systematics-oriented journals, especially those targeting much-needed alpha taxonomic work tend not to be ranked highly and in many cases are neither ranked nor abstracted, making material difficult to track online. Similarly, the traditional methods for the citation of taxon names and or publication information of names and synonymy in taxonomic journals tends to result in these publications not

being listed in the references, and thus not counted as 'cited' by the bean counters. With the pressure by managers to have 'performance-based' reviews, the choice of journals is increasingly less about the best forum for the research and more about the highest citation-rated journal that might accept the paper. Accordingly, there is a need for journals and other publications (such as flora treatments) focusing on plant taxonomy and systematics to have a citation rating (where possible) and clear indications reflecting that they are refereed if the contributions by researchers, especially University academics are to be recognised as 'countable'.

Thrown in at the deep end: editorial experiences with *Nuytsia* 17

Juliet Wege, Kelly Shepherd, Ryonen Butcher
Western Australian Herbarium

Volume 17 of *Nuytsia* was produced as part of the Western Australian Government's Saving our Species taxonomy project, a short-term funding initiative which aimed to expedite the description of taxa of conservation concern, particularly those vulnerable to mining activity. The volume—in which 95 taxa were newly described—far exceeded original expectations thanks to the generous input of time and expertise from a substantial number of Australian scientists. As early career botanists with limited editorial experience, we faced a number of challenges in producing such a large volume within the project time-line. These included becoming familiar with editorial and publication processes, finding suitable reviewers, dealing with inadequate

reviews and preparing a large number of images for publication. A transition to complete in-house production meant that we had to acquire and learn new software (*Adobe InDesign*) and page set the volume. We were thankful for the existence of a database for tracking papers at their various stages and for the in-house support we received, particularly in checking specimen citations, nomenclature and conservation listings. The use of colour, a first for *Nuytsia*, has been very well received by stakeholders and we hope that funding will be made available to enable its continued use. This editorial experience, whilst at times stressful, was highly instructive, personally rewarding and achieved tangible biodiversity conservation outcomes for Western Australia.

Outcomes of the teaching systematics discussion session

Kristina Lemson
Edith Cowan University, Joondalup, Western Australia

The Teaching Systematics session raised some important and ongoing issues in the delivery of systematics courses in Australia. Chaired by Bob Hill (University of Adelaide) assisted by Kristina Lemson (Edith Cowan University), the session started with four presentations, by Pauline Ladiges and Michael Bayly (The University of Melbourne), New Zealanders Chrissen Gemmel (University of Waikato) and Phil Garnock-Jones (Victoria University, Wellington), Jeremy Bruhl (University of New England) and me. These set the scene for the intervening and following discussions, and addressed a wide range of factors impinging on the current body of university staff and our students. These included the constitution of the current taxonomic workforce in Australia; changes to the content and structure of degrees (both distant and recent) and the student body; the demands on academics. The floor was then opened to further questions and discussion.

The need to educate and retain new systematists/taxonomists has been discussed at length many times over, and is clearly becoming of greater and greater concern. All the presentations included comments on factors relating to this issue. These included the increasing age of the national taxonomic workforce, the loss of taxonomists from academia, numbers of students taking up systematics at postgraduate level, the amount of material students are expected to cover in a degree and the increasing time and research pressures on academics.

Ways to attract and retain postgraduate students was of major interest. The reconfiguration of degrees at Melbourne to where standard pathways will include a 3 year generalist undergraduate degree followed by a 2 year masters specialization, sparked some interest. Mike Bayly outlined a proposal from Pauline Ladiges for a multi-institutional national masters program, similar to one in operation in Forestry, and Chrissen discussed a multi-agency approach in New Zealand. Four Universities, the NIWA, LandCare NZ and Te Papa have combined together to apply for funding for a program to start in 2011. Bob Hill noted the existence of the Federal Government Structure and Diversity fund for new courses at universities, and there was a suggestion that this could be tied into the proposal from Pauline.

There was also some discussion of the undergraduate student perspective. My presentation included some comments about the academic and non-academic pressures on students, including the need to work in order to afford a University education, changes in the family and educational backgrounds of incoming students, and the breadth of material that is taught in university curricula. I noted that studies of first year science students at Edith Cowan University in 2006 showed that, in addition to studying at university full time, many students work between 20 and 30 hours per week in order to meet their costs of living. I also raised some issues particular

to the Western Australian situation, where high employment levels among graduates have been driven by the drainage of the workforce into the resources sector. A large proportion of recent graduates from ECU have moved into environmental consultancies, are well paid, and do not consider continuing on to Honours or Masters level. This decision is impinged upon by the fact that current Federal postgraduate scholarships place PhD candidates on or below the poverty line, and there are few scholarships for Honours students that include cost of living support.

The related questions of breadth of content and academic standards were taken up by several people. The general pattern appears to be that, as curricula have become increasingly crowded, the teaching of fundamental botany at first year level is minimal and content moves into second and third year. This has implications for course structures at higher year levels. The question of the quality and skill levels of new graduates was discussed, both generally and specifically in relation to their movement into the workforce. This topic deserves more consideration, as shown by the conversations about the pros and cons of the Melbourne degrees and Jeremy Bruhl's comment that students need time to develop academically. Several people expressed concern about deficiencies in certain skills among new PhD candidates, and the need to identify a standard set of skills required for new people entering PhD programs. I also suggested that we need to consider just what we do expect all students to be able to do, given the breadth of the curriculum. Several people described programs that give opportunities for students to get hands-on experience in particular institutions, such as internships and a course at Charles Darwin University that involves industry experience at the local herbarium.

Chrissen Gemmel described how funding for courses in both NZ and Australia is related directly to 'bums on seats' (BoS). The formula for the unit "bum dollars" (known in university administration circles by such prosaic names as "Equivalent Full Time Student Units" or EFTSUs) was considered, with the New Zealand model based on 80% BoS and 20% on a research component. Funding based on student numbers has both positive and negative implications. These included the possibility of academic standards being lowered in order to retain larger numbers of students, and the possibility of some Universities fining departments who run courses with low student numbers. The former has been a bugbear of academics for some time, and discussion centred on the problems associated with a drop in standards generally, for example

in terms of English proficiency (among both overseas and local students). However, there were also examples where the removal of prerequisites for second year botany courses has had benefits in terms of the ability to maintain numbers and the influx of enthusiastic students. It was also noted, however, that BoS is related to budgets for both teaching and research, and that research in Australia is not paying its way.

The nexus between research and teaching was canvassed in two of the presentations. Mike Bayly and Pauline Ladiges noted the possible effect of the Research Quality Framework (RQF) proposed by the previous Federal Government, and the topic was elaborated on by Chrissen Gemmel and Phil Garnock-Jones. The New Zealand Performance Based Research Fund system is in place already, with researchers categorized into one of several bands. The PBRF has direct effects on teaching, as its formulation mitigates against Universities employing systematists and valuing their research. The rating of an individual researcher is based 70% on publications, 15% peer esteem (grants, invitations, awards, etc.) and 15% on contributions to their research environment. There are currently no taxonomists in New Zealand rated in the A band; A band lecturers are 'considered likely to have an international reputation'. The situation in Australia is in flux, given the Rudd government's cancelling of the RQF as first formulated. However there is real concern (not unfounded if the UK experience is anything to go by) that this kind of approach will only compound problems that arise from the lack of taxonomists and systematists in academia. There is widespread concern about the ARC's plans to categorise journals, and for funding to be related to simple metrics that are too coarse to have much meaning. Some of this is considered in Tom May's item in this newsletter on publishing systematics.

The session ended with some discussion of actions for the immediate future. The Society saw merit in Pauline Ladiges' proposal for a multi-institutional postgraduate course, and in exploring proposals from CHAH relating to accreditation of plant identification skills. The general feeling was that ASBS needs to continue and deepen its discussion of educational matters, and that a similar session at future conferences is desirable.

I am compiling a list of those interested in continuing these, and other, teaching related discussions. Please contact me by email at k.lemson@ecu.edu.au and use the phrase *teaching systematics* in the subject line if you would like to join in.

Report of Monocots 4 / Grasses 5, Copenhagen, 11–15 August, 2008

Bryan Simon
Queensland Herbarium

The 4th International Conference on the Comparative Biology of the Monocotyledons and the 5th International Symposium on Grass Systematics and Evolution (Monocots 4/ Grasses 5) was held in Copenhagen from the 10th–15th August 2008. It was attended by 250 participants from 40 countries, with most coming from the USA (37), the UK (27), Denmark (23) and Brazil (23); there were 8 participants from Australia.

The international Monocot Conferences and Grass Symposia had independent origins with the first Monocot Conference at Kew in 1993 (Rudall et al. 1995) and the first Grass Symposium at the Smithsonian Institution in 1986 (Soderstrom et al. 1986). A grass symposium was held in Russia in 1994 (Skvortsov & Semikhov 1994), and was subsequently named the second international Grass Symposium, although it was attended by only two non-Russian participants. Monocots 2/ Grasses 3 in Sydney in 1997 (Wilson & Morrison 2000; Jacobs & Everett 2000) was the first time the two meetings were held in unison. The trend was maintained in Claremont, California in 2003 with Monocots 3/ Grasses 4 (Columbus et al. 2006; Columbus et al. 2007).

The venue for Monocots 4/ Grasses 5 was at the H.C. Ørsted Institute on the North Campus of the University of Copenhagen and delegates were accommodated at several hotels within walking distance of the conference venue, but the venue could also be easily accessed by bus or a combination of bus and metro. The organising Committee of nine was chaired by Professor Ole Seberg of the Natural History Museum of Denmark, University of Copenhagen and comprised staff from the Natural History Museum and Biological Institute, University of Copenhagen and the Biological Institute, University of Aarhus.

Social events associated with the conference included a welcome reception at the conference venue, a reception at the Town Hall of Copenhagen (Fig. 1) including a very well stocked buffet that included the renowned “Town Hall pancakes”, a reception in a glasshouse of the Botanical Garden hosted by the Natural History Museum and a conference dinner in Restaurant Påfuglen in the Tivoli Gardens, with a dinner talk by Prof. Henrik Enghof, a zoologist and director of the Natural History Museum. In addition participants enjoyed each other’s company at several venues ranging from breweries to a variety of restaurants in the

very colourful city of Copenhagen. A number of people were somewhat disappointed in not being able to participate in some of the field trips that were promoted in the pre-conference literature, but unfortunately they all had to be cancelled for not meeting their quota.

Talks were grouped into 15 sessions that, apart from the opening and closing sessions, were run concurrently in three different auditoria. Although Monocots 4/Grasses 5 was presented as one set of meetings, sessions on the grasses and non grasses were more or less separated, except for a general session on the Poales and E-taxonomy. An opening address by Ole Seberg briefly traced the early monocot classifications from those of John Ray to those of Linnaeus and through to the monocot system of Dahlgren when the first true cladograms of the group were published. This was followed by the presentation of the Rolf Dahlgren lecture – From *Albertus Magnus* to *AToL* (Assembling the Tree of Life) by



Fig. 1. Town Hall of Copenhagen

Ph. Bryan Simon

Dennis Stevenson, New York Botanical Garden, in which he gave a history of how classifications have changed over the years from systems that are useful for identification to those that reflect phylogeny and are shown on the ATOL webpage.

Other talks, showing the session titles and the number of talks in each group, are shown:

I attended only the talks covering the grasses and will briefly discuss the highlights of some of these. All grass subfamilies except the Micrairoideae were well covered from a molecular phylogenetic perspective, as well as the groups basal to the grass family. As well as specialist studies in each subfamily there were a couple of presentations on the grass family as a whole, Hodkinson et al. for 800 grass genera and Salamin et al. for supermatrices available online, mainly from data from Genbank.

A study of the tribes Andropogoneae and Arundinelleae (Teerawatananon & Hodkinson) showed the former to be monophyletic and the latter not to be so, corroborating results that have been published previously for these groups. Presentations on the molecular phylogeny of the Danthonioideae based on 288 species (Pirie and Humphreys) looked particularly at the biogeography, leaf anatomy and lemma morphology of this subfamily. Nomenclatural changes that are projected in this group following expanded recent collection and sampling in Australasia, Chile and southern Africa are the subsuming of *Austrodanthonia*, *Notodanthonia* and *Joycea* into *Rytidosperma* in Australia and the erection of some new small genera in South Africa.

In the bamboos, with 1400 species classified into the woody Bambuseae and the herbaceous Olyreae, much progress has been made since the last grass symposium in the understanding of their phylogeny, largely due to the efforts of the BPG (Bamboo Phylogeny Group), a collaboration of 20 bamboos specialists from 11 countries, working on the first widely-sampled data-rich phylogeny estimation for bamboos (Clark; Kelchner & Clark). There were two other talks on bamboos, one looking at the phylogenetics of Old World and austral bamboos, in particular *Dendrocalamus* (Sungkaew et al.), where *Dendrocalamus* was shown to be paraphyletic, and one on inter-generic hybridisation in the temperate bamboos (Triplett & Clark), where many current recognised genera were shown to be polyphyletic. The molecular-based phylogeny of all the bamboos indicates that the temperate bamboos are sister to a group of tropical bamboos and Olyreae (herbaceous bamboos) and within the tropical bamboos the New World bamboos are sister to Old World and southern bamboos.

There were nine presentations on the molecular phylogeny of pooid grasses, either of the whole subfamily using 3300 species (Davis & Soreng) or on various groups within the subfamily. Romanaschenko et al. looked at Stipeae phylogeny based on nuclear and plastid DNA sequences, where a new phylogeny of the family was presented based on 21 genera and 524-604 species worldwide. In the phylogeny are two main lineages, one Eurasian and the other Australasian-American, with a new genus *Pappostipa* in the New World. In sharp contrast with this talk was a poster of Tom Cope, in which he shows a continuum in spikelet morphology over the range of the stipoid grasses that necessitated, in his opinion, maintaining a single genus *Stipa*. Two talks were given on the subtribe Poinae by Soreng and Gillespie (Fig. 2); one focussed only on *Poa*, the world's largest grass genus with 500 species, of which a molecular phylogeny based on one plastid and one nuclear sequence data was provided for c. 200 accessions, producing a classification of 5 subgenera; the other talk looked at phylogeny, reticulation and character evolution in the Poinae, including *Poa* and 13-22 smaller genera, from which it transpires that new generic status is required for *Poa queenslandica*. Other pooid presentations included polyploid speciation and evolution in arctic *Puccinellia* (Consaul et al.), phylogeny of *Calamagrostis* and related genera (Saarela et al.), evolution of Loliinae/Aveneae (Pereira et al.), systematics and phylogeny of Koeleriinae (Quintanar et al.) and chromosome evolution in some Aveneae (Roeser et al.).

Two talks on chloridoid phylogeny were given, one on the whole tribe Chloridoideae (Bell & Columbus) and the other on the subtribe Muhlenbergiinae (Peterson et al.). The Chloridoideae with 145-160 genera and about 1400 species is well supported as being monophyletic by molecular data, although there are no known morphological synapomorphies for the subfamily. A total of 112 species from 84



Fig. 2. Rob Soreng and Lynn Gillespie

Ph. Bryan Simon

genera were sampled and produced 4 lineages, *Triraphis*, the *Eragrostis* clade, the *Sporobolus* clade, and a large clade of two sublineages, one mainly New World & Cosmopolitan & the other mainly New World. The addition of another chloroplast sequence (*ndhF*) increased resolution and support from the phylogeny of 2007, when there were three lineages. The Muhlenbergiinae consist of 10 genera and 173, almost entirely New World with species diversity greatest in Mexico with 125 native species, 55 of them endemic. As the phylogeny based on ITS and *trnL-trn* sequences, shows 9 small genera nested within a paraphyletic *Muhlenbergia*, the proposal is to place all in *Muhlenbergia*.

One talk was given on the phylogeny of the subfamily Aristidoideae (Cerro et al.), comprising the genera *Aristida* with 250-300 species, *Stipagrostis* with 50 species and *Sartidia* with 4 species. There are four centres of diversity for *Aristida* – North America, Central & South America, Australia and Africa, *Stipagrostis* is mainly African, with a few species in Asia, and *Sartidia* is restricted to Africa. Both *Aristida* and *Stipagrostis* have a C₄ NADP-ME photosynthetic pathway, whereas *Sartidia* is C₃. The subfamily and all genera are monophyletic, based on chloroplast and nuclear DNA sequence data; however Henrard's sections are not. One species (*A. longifolia*) from South America is C₃ and sister to other *Aristida* species. From the cladogram most species of *Aristida* do not follow a geographic pattern, except for Australia.

The phylogeny of the Paniceae, integrating chloroplast DNA sequences and morphology, was presented by a group of mainly Argentinian botanists from Instituto Darwinion, San Isidro (Morrone et al.). The tribe Paniceae, comprising 110 genera and 2000 species world wide, is not monophyletic but consists of two lineages, one of which has $x = 10$ and groups with the Andropogoneae and the other is an $x = 9$ clade, results which have been published previously (Aliscioni et al 2003). The $x = 9$ clade consists of 7 clades that I shall list (with Australian genera indicated) included: *Digitaria* clade, Neurachninae clade (traditional genera + *Calyptochloa*, *Cleistochloa*, *Ancistrachne*), Forest Shade clade (*Alloteropsis*, *Cyrtococcum*, *Oplismenus*, *Echinochloa*, *Entolasia*, *Ottochloa*), *Sacciolepis* and *Panicum* clade, *Dichantherium* clade, *Panicum* s.s. clade, PEP-CK clade (*Eriochloa*, *Megathyrsus*, *Melinis*, *Moorochloa*, *Thuarea*, *Urochloa*), Bristle clade (*Setaria*, *Cenchrus*, *Pennisetum*, *Alexfloydia*, *Whiteochloa* and *Zuluagaea*). Of particular interest regarding the Bristle clade is that there are a number of genera without bristles (Australian genera are the last three listed) that are placed here on molecular evidence. The $x = 10$ clade has *Paspalum* and

Axonopus and several smaller genera which are mainly American except for *Dallwatsonia*, *Lecomtella* and *Baptorhachis*.

One of the penultimate sessions of the conference was the one on E-Taxonomy, which was well attended by a cross-section of both monocot and grass people. Two of the speakers were zoologists who are engaged primarily in bioinformatics. The first (Web taxonomy: The future or a distraction? - Godfray) presented a radical view that taxonomy could become a wholly web-based activity in the present climate of the need to know biodiversity information quickly and efficiently for all sorts of reasons. This was followed by talk on what is E-taxonomy (Mayo), how it can be used and challenges for sustaining online revisions including software updates, resources, common objectives, effective peer pressure and recognised value of web publication. Four current initiatives were discussed. The e-taxonomy module of EDIT (European Distributed Institute of Taxonomy) was the focus of the next talk (Villalba & Baker), in which the website PALMweb, one of the three groups currently used in EDIT to explore e-Taxonomy in practice, was demonstrated. The talk on Scratchpads (Smith, Rycroft, Roberts), developed in association with EDIT, illustrated how to provide a flexible resource for taxonomists to collaborate online with specific taxonomic groups. In the first year of operation 466 people from more than 30 countries have registered for Scratchpads, producing more than 110,000 web pages. In the final talk of the E-taxonomy session I gave an account of the current status of the *GrassWorld* project.

There were 77 posters listed in the abstracts, although it appeared that there were a number of presenters who did not actually make it to Copenhagen, judging from the empty spaces on poster boards. Of the posters that were listed, 25 were on grasses, 9 on sedges and 41 on other monocot families and groups. There were also two papers by Russian authors, of a theoretical nature looking at subjects such as fertilization and the relationship between reticulate evolution and cladistics. There was only one formal viewing session of an hour and a half when authors could answer questions on their posters. A suggestion for future meetings is that posters be put up in two separate sessions, with perhaps the opportunity for authors to speak briefly on their posters as was done at the last ASBS meetings in Cairns, Darwin and Adelaide. Often more work goes into poster presentation than preparing a talk and it would be nice to see more appreciation of this effort by participants.

The closing lecture by Mark Chase summarised the great progress in monocot phylogenetics in the fifteen years since the first monocot conference at

Kew, due to the abundance of DNA sequence data. In recent years the emphasis has changed from higher-level groups to genera, and that most trees are produced using a combination of plastid and nuclear genes are supported; the mitochondrial genome, however, has presented some problems. The future will look at new methods of sequencing more of the nuclear genome and new techniques to examine polyploidy.

What came across particularly strongly to me from this conference is the overwhelming use of molecular phylogenetics as the accepted way of doing systematics these days. Indeed the point was alluded to by Dennis Stevenson in his opening address when he gave a defining difference between taxonomy and systematics as he saw it. The first could be done by amateur naturalists as well as professionals and involved what has generally been called alpha-taxonomy, with a focus mainly on morphology, whereas systematics was undertaken by "scientists" working with molecular methods.

The next conference (Monocots 5/ Grasses6) is to be held at the New York Botanical Garden in 2013.

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ABLO reports

Final report

Jeremy Bruhl Outgoing ABLO

This week I presented a seminar at UNE on my time as ABLO. In preparation for that I reviewed my calendar and looked over the 30,000 or so images I took during my tenure, so my head is buzzing with the year-long experience.

Visitors hosted or facilitated by ABLO & requests

Visitors continued to arrive up to and including my last week at Kew. Visitors since the last report included A/Prof. Caroline Gross (UNE; and family), Kirsten Cowley (CANB; and family), Paul Armstrong (DECC), Holly Rhodes (Australian expatriate living in Kew area), Russell Barrett (KPBG/UWA), Karen Wilson (NSW), Mike Barrett (NSW volunteer)

Herbarium requests came from ABC (via K), BRI, CANB, CHR, MEL and library requests were fulfilled for BRI. As usual, most of those herbaria listed involved multiple requests.

The ABC request was for specimens collected by Darwin and J.D. Hooker for use in an upcoming production featuring the Director of Kew, Prof. Stephen Hopper with those specimens. Locating specimens collected by Darwin and Hooker was

a relatively easy matter, now that some of their collections have been added to the electronic database. This is an increasingly useful database for Australian and New Zealand botanists too as more specimens are databased and scanned and these data and images made freely available on the 'Kew Herbarium Catalogue' (Web ref. 1).

Visits to herbaria & Monocots4

Caroline Gross was chasing a particular type supposedly held at the herbarium of the Chelsea Physic Garden (CHEL). With the permission of the director and the generous help of Dr David Frodin, currently working on cataloguing the garden collection and curating the associated voucher herbarium, I arranged for both Caroline and me to visit. It was a brief and highly interesting trip, but alas the particular specimen in question was not found.

The International Monocots IV conference in Copenhagen 11-15th August (Figs. 1, 2; Web ref. 2) was the major event for cyperologists and other monocot researchers and the deadline for much of my own research during my time at Kew. Highlights were the opening talk by Dennis



Fig. 1. Left to right: Dave Simpson (K), Marty Lechowicz (Magill University), Karen Wilson (NSW), Marcia Waterway (MGMT), Jeremy Bruhl (ABLO; NE) Monocots IV conference Copenhagen.

Stevenson and closing talk by Mark Chase. There was also a book launch for the new edition of *Genera Palmarum*.

I joined a group of other botanists from the meeting to use the Copenhagen Herbarium (C) on the Saturday after the conference. On Sunday I travelled with my family via a quick train trip to Lund in southern Sweden. Most of the botanists at Lund Herbarium (LD) work on lichens and fungi, but they had an influx of Cyperaceae botanists with Russell Barrett (Fig. 3), Karen Wilson and me converging on their sedge rich collection, with Preiss specimens being of particular interest.

Events and news

The three major herbaria in the UK (by size: K, BM, E) have been discussing co-operation and communication, culminating in a meeting of their directors/heads at E.

Kew seems set to take advantage of the completion of the new wing for the Herbarium and Library by rearranging the herbarium to conform to the APG2 classification (Web ref. 3).

Fig. 2. Left to right: Jeremy Bruhl (ABLO, NE), Dave Simpson (K), Muthama Muasya (Uni of Cape Town). Cyperaceae colleagues and coauthors preparing for Monocots IV.



The 53rd ABLO, Dr Tony Orchard accompanied by his wife, assistant/volunteer Tessa Orchard, arrived at Kew 28 August 2008 in time for two days overlap with me. I was very grateful to Tony and Tessa that they were able to arrive then, as we were on fixed one-year tickets and had were set to leave on the last possible day, 30 August. This was a particularly exciting time for us, with completion of clearout of offices, labs and home, packing for leaving, hellos and final farewells.

I want to thank ABRS and UNE for support as ABLO, and Kew for hosting me and the position generally. Thanks also to all the individuals who facilitated the time away and made the year a success, and to the Barker family for dealing with my contributions to the Newsletter.

Return to UNE

Amazingly, we arrived back in Armidale with all our checked in and hand luggage at the same time. The boys were back at school the next day.

It was less than a fortnight before our first visitor from Kew! Christopher Flynn (Kew Gardens Diploma of Horticulture) came to Armidale to visit the Snow Gum grassy woodlands of New England National Park and remnants in Armidale and to use the N.C.W. Beadle Herbarium as part of dissertation research 'A Study into the Botanical and Educational Value of Habitat Re-Creation in Botanic Gardens'. We look forward to more visitors from Kew.

Is ABLO for you?

Despite the internet and online databases, there are many enquiries and visitors for ABLO to

deal with. Of course, such databases do not fully replace examining specimens first hand, but are fantastic for locating material and deciding priorities. Service is only half the job of ABLO and there are great opportunities for botanists in spending the time based at Kew. I have suggested in a recent video presentation (Web ref. 4) at ASBS conference in Adelaide that, with institutional support, there are many early career botanists for whom the position of ABLO could be a real option with benefits for Kew, Australia and of course the individual. Regardless of stage of career ABLO could be for you...

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Web ref. 2: <http://www.monocots4.org/>

Web ref. 3: <http://www.systbot.uu.se/classification/classification.htm> & <http://www.mobot.org/MOBOT/research/APweb/welcome.html>

Web ref. 4: <http://picasaweb.google.com/jbruhl/UNESystematics#>



Fig. 3. Russell Barrett (KPBG, UWA) at front door to Lund Herbarium, Sweden

First report

Tony Orchard
Incoming ABLO

Tessa and I arrived in the UK late on 27th August, giving us two days of overlap with Jeremy Bruhl. This proved invaluable, and Jeremy did an excellent job of providing an overview of the ABLO's duties, introductions to many of the key Kew staff, and an orientation of the herbarium and other buildings, even while he and Fran were preoccupied with last minute packing (and in Jeremy's case, last minute research). This overlap period is invaluable, and future ABLOs are encouraged to try to engineer something similar. We had heard horror stories of the difficulty in setting up bank accounts, but had no trouble. We were amazed to find that banks (Barclays at least) opened on Saturday mornings, and encouraged customers to come in and talk to staff - their Richmond branch was busier than the railway station. The trick to opening an account seems to be identification: your passport is essential, and a signed residential lease is very helpful, but the really vital piece of paper is a utilities bill. We presented a gas/electricity bill from Canberra, and this did the trick. Truly! We had deposit accounts, on-line banking access, cheque book and debit cards within a week. Getting a local credit card

may be more difficult (we didn't try) but for occasional large purchases, Australian credit cards work OK (tell your bank that you will be using it overseas), and the fees charged are probably comparable with the costs of bringing Australian dollars into the sterling area anyway. Tesco's and Sainsbury's beg their customers to take out one of their credit cards, but we have not investigated the rules.

Buy one, get one free

This is one of the most common signs in UK shops at present, and it seems to apply also to the ABLO. Tessa has been signed up as a Kew Herbarium Volunteer, which gives her an electronic pass and computer log-on. She will be acting as part-time Assistant ABLO (or as some refer to her - ABLO CEO), and helping out with photography, listing and scanning duties. Jeremy had instituted the practice of the ABLO listing exchange specimens from Kew destined for Australia, to meet the requirements of AQIS, and she has started on this. Later, we are hoping to be trained in scanning and databasing of specimens, to advance the GBIF project that has fallen into abeyance. She will also

be assisting in transcription of Allan Cunningham manuscript material both at Kew and the Natural History Museum.

Visitors and requests

A number of Australians have visited Kew in the month I have been here, the first arriving to see me even before I had officially started: Joan Bryant (Royal Botanic Gardens, Sydney), Eleanor Cave (University of Tasmania), David Lawrence (University of New England) and Sarah Ashmore (Griffith University). Christina Flann (formerly of Melbourne) has also visited from her current base in the Netherlands. Requests have been rolling in regularly, from University of Canterbury, Te Papa Museum, and Victoria University of Wellington, in New Zealand, ABRS (2), CANB (2), University of NSW, Brisbane (private), and one from Kew. I have also assisted in pulling out Charles Darwin and J.D.Hooker collections for filming by an ABC film crew.

Weather

The English agree that this has been a miserable summer, and even the squirrels are developing webbed feet. In fact I think we were here for most of the summer, on August 30th. Only a handful of days since then have been sunny, and in the interim there have been major storms in the west and north with quite serious flooding. An interesting contrast with the drought-stricken Canberra we left.

Requests

May I make the perennial request that those seeking information on specimens and literature provide as much information as possible, to help me find your material? While Kew has unbelievably rich library resources, having to search out protologues etc for specimen details can be time-consuming. As they say on *The Bill*, every bit of information that you can provide me with, no matter how small, can be valuable. And please check within Australia for literature sources before requesting it from the ABLO: the UK has much more rigid copyright conditions than Australia, so the paperwork for copying can be irksome.

Visits to other herbaria

Over the next 12 months I will be spending substantial amounts of time at BM as well as at K, and will of course be visiting LINN. In addition I have fairly firm plans (but no dates yet) to visit at least E, FI, P and PR. I will endeavour to let CHAH know at least a week in advance of any herbarium visits outside of London, but if anyone has particular requests for any UK or European herbaria, please let me know and I will try to fit in as many as possible.

Farewell for Sally Bidgood

A major function has been a farewell retirement lunch for Sally Bidgood, a long-term (35 years) staff member of Kew, remembered particularly for extensive fieldwork in East Africa (in particular in Ethiopia and Tanzania). The lunch, on 26 September, was extremely well-attended by current and past staff members. Kew certainly knows how to do retirement lunches - the groaning table, in richness and variety, would not have gone amiss in Henry VIII's palace. Speeches by the Keeper, David Mabberley, and by her frequent field companion Ib Fries (C) paid tribute to her enormous contribution to Kew and botany in general.

New wing at Kew

The new wing of Kew herbarium (Fig. 1) is now externally in its final form, and the internal fitout has begun. It is expected that the move into this wing will begin in the first half of 2009. This will particularly affect the Compositae and Leguminosae, the major families to be housed there, but there will be knock-on effects in many other parts of the collections as they expand into the space left by the removal of Compositae and Leguminosae. Disruption for 12 months (most of 2009) would seem to be unavoidable, so those planning a trip to the UK should bear this in mind and enquire in advance on availability of collections, and library (which will also be moving). If you are likely to require me to search the collections or library on your behalf, a note sooner rather than later would be wise.

New home for BM

The botanical collections at the Natural History Museum will also be moving during the next year, into the new Darwin Centre. At this stage the move is expected to begin in February and take about 6 months. Again, anyone planning to visit should enquire in advance about access, which is likely to be restricted, at least on a rolling basis. If you are likely to want me to access the collections on your behalf, a request in the next month or so would be advisable.

Down House, temporary closure

Down House, the home of Charles Darwin, will be closed from 1 November 2008 to 13 February 2009, while new displays, video guides to Darwin's experiments in the garden and a digital version of the *Beagle* collection, are installed. These improvements are a prelude to major celebrations next year for the bicentenary of Darwin's birth, and the 150th anniversary of the publication of *On the Origin of Species*. From February an on-line virtual tour of Down House



Fig. 1. New wing of the herbarium

Ph. Tony Orchard.

will be available on the English Heritage website. (*Heritage Today*, journal of English Heritage).

Exhibitions and seminars

One of the delights of being in London is the wealth of events available. Last weekend Tessa and I attended the exhibition *Amazing Rare Things* in the Queens Gallery at Buckingham Palace. With an audio commentary by Sir David Attenborough, it featured natural history studies by Leonardo da Vinci (1452–1519), paintings from the collection of the Italian Cassiano dal Pozzo (1588–1657), plates from the *Florilegium* of Alexander Marshal (c. 1620–1682), plates from the *Metamorphosis Insectorum Surinamensium* (1705) of Maria Sibylla Merian (1647–1717), and

watercolours from *Natural History of Carolina, Florida and the Bahama Islands* (1729–1747) by Mark Catesby (1682–1749). As the collection is unlikely to get to Australia, for those interested there is a sumptuous (and remarkably cheap) book available: *Amazing Rare Things: The Art of Natural History in the Age of Discovery* by Sir David Attenborough, Susan Owens, Martin Clayton and Rea Alexandratos (Royal Collection Publications: 224 pp, 160 colour illustrations, £9.95).

At the Linnean Society of London on 1–3 October there was a festschrift for Chris Humphries, entitled *Beyond Cladistics*, attended by 40–50 of his friends and colleagues from around the world. The varied, entertaining and instructive program covered topics from individual cladistic studies to philosophical discussions on the importance of descriptive taxonomy, homology in classical and molecular taxonomy, island biodiversity, species concepts, ontogeny, triads and much more. Organisms used to illustrate the talks ranged from microorganisms to plants, fishes, and birds. The Australian viewpoint was catered for by a paper on *Eucalyptus* subg. *Eucalyptus* phylogeny delivered by Pauline Ladiges (for co-authors Michael Bayly and Gary Nelson).

I will probably be visiting Oxford before Christmas, so any requests for consultation of that herbarium should be sent to me as soon as possible.

ABRS report

Staffing

Xiufu Zhang, who has been working as an assistant editor on the Flora, left in July to take up a new position with the Approvals and Wildlife Division of the department. Bin Tan also finished his work on the Australian Faunal Directory at the end of the financial year. We wish them both well in the future.

Flora of Australia - unpublished manuscripts

To help make the backlog of unpublished *Flora of Australia* manuscripts accessible, we are investigating the idea of offering authors the opportunity to have their manuscripts linked to the Flora of Australia On-line. This is not intended to replace hard-copy publication, but as an interim method of making the information available. Descriptions of unpublished taxa would not be made available. I would like to hear your thoughts and ideas on this, so please email me at annette.wilson@environment.gov.au with any comments or questions.

Grants program

In April 2008, the ABRs Advisory Committee recommended revising the National Taxonomy Research Grant Program both to increase the pool of funds available to support high priority research and to streamline administration of available funding. The Minister agreed to a proposed approach and this will come into effect in the 2009/2010 grants round. The changes are designed to:

- increase funding for taxonomy — through stronger co-funding opportunities
- build the taxonomic workforce — in line with recommendation 1.2 of the National Action Plan for taxonomy in Australia (see the Proceedings of the National Taxonomy Forum, p. 6)
- simplify administration processes — for ABRs and the Advisory Committee
- simplify the application process — for applicants

The new program features:

- Fixed grant amounts — Applicants will now apply for grants under a scheme of set levels

of funding. The funds available for new grants will vary over the next few years as the changes to the National Taxonomy Research Grant Program are implemented. However, subsequently, this feature will enable ABRS to predict in advance the exact number of grants available each year.

- Fully funded grants — Successful grant applicants are now guaranteed receipt of the full amount of funding requested, via fixed grant amounts.
- Capacity-building grants and research grants — The new program has a designated capacity-building allocation aimed at building the taxonomic workforce, as well as funding for research grants of various specified sizes.
- A cash co-funding requirement for Research Grants — All ABRS Research Grants (except ABRS/CReefs Tropical Marine Postdoctoral Fellowship Grants) will now be co-funded. That is, applicants must have obtained a commitment for the applicable amount of cash co-funding for their application to be considered.
- Substantial Supplement Partners — ABRS will partner with organisations or consortia interested in bringing significant funding to a broad area of taxonomy research to secure matching funding for that area from the National Taxonomy Research Grant Program. ABRS is pleased to announce that CReefs is ABRS's first Substantial Supplement Partner, beginning in the 2009–10 grants round a three-year investment of \$200 000 per year. ABRS welcomes further Substantial Supplement Partners for the 2010–11 grants round.

We anticipate that the changes to the grants program should increase support for early career researchers and retired professionals or taxonomists not employed at institutions. There is increased scope for major, national-scale investigations incorporating multiple researchers and institutions. We have tried to simplify the

application and guideline forms into a simpler, single document and ensure that grantees will now receive the amount requested if their application is successful. Further details of the changes are available from the ABRS website.

In press

Flora of Australia volume 44A, *Poaceae* 2, is in press, and we expect its publication in early 2009.

This volume documents four subfamilies of the Poaceae, describing 77 genera and 405 species. The subfamilies are: Pharoideae, Pooideae, Bambusoideae and Ehrhartoideae. Books will be available from CSIRO Publishing for \$130 (hardcover) or for \$110 (softcover).

Recent publication

***Tenebrionid Beetles of Australia, descriptions of tribes, keys to Genera, Catalogue of Species.* By E.G. Matthews and P. Bouchard. B5, Hardcover, ISBN: 978 0 642 56857 1. Available from ABRS for \$120 (including GST and postage)**

This is the first ever Australia-wide review of this family, members of which are so very diverse that no one common name has been applied to them. Among tenebrionids are meal worms that occur in stored grain, false wireworms that are of economic importance as pests of crops, and a group of beetles found in arid regions and referred to very descriptively as pie dish beetles. The book summarises eight subfamilies and 43 tribes, gives keys to 216 genera and subgenera, and catalogues 1595 species. It is illustrated profusely and will serve primarily as an introduction to the adults of the family in Australia, providing a starting point for more detailed studies at species level.

Annette Wilson

Miscellanea

Swiss Orchid Foundation

The website of the Swiss Orchid Foundation at the Herbarium Jany Renz, University of Basel may well be of interest to Australian orchidologists.

The Swiss Orchid Foundation has been established since October 3rd, 2001 and is based on the herbarium and library of the late Dr. Jany Renz. Through this site you can access 25,000 Herbarium Specimens of Orchids from the Collection of Renz, Bernoulli & Cario, Basel Botanische Gesellschaft (BBG) and Botanisches Institut Basel (BIB).

The Foundation has started a database of photographs, hand-coloured drawings and

herbarium specimens. To test the relevance to Australian orchids: a query of *Calochilus campestris* returned 1 herbarium specimen and three images of plates from Nicholls' and Fitzgerald's books on Australian orchids. A query on *Eriochilus cucullatus* returned two Constable collections, ex NSW. Incidentally it was surprising to see that *Disa bracteata* appeared in Nicholls *Orchids of Australia* in 1951. When it first appeared in a state flora or census needs checking, but it was probably much later.

There is also a worldwide orchid literature database containing most of the existing journal articles, books and preprints on orchids.

www.orchid.unibas.ch

Book reviews

Setting new standards: an account and key to Australia's smut fungi

Greg Kirby
Flinders University

***Fungi Of Australia: The Smut Fungi.* By Kálmán Vánky & Roger Shivas. CD-ROM by Dean Beasley. Published March 2008 by CSIRO Publishing & Australian Biological Resources Study (ABRS). Hardback (276 pages, 250 x 176 mm) & CD: AU \$130.00. ISBN: 9780643095366**

This is the book I would have killed for in order to get it in my hands about 25 years ago. At that time I was trying to run a research project on the biology of smut fungi and collecting smuts everywhere that I visited. The poor state of knowledge about the taxonomy of these fungi was a constant source of frustration. I received taxonomic advice from Langdon, Walker and Vánky, but they were clearly busy with their own projects and I suspected that the whole taxonomic scheme was a bit of a charade. I attempted to put names on most of my collections, but many were very uncertain. The large genus *Ustilago* seemed to typify the basic problem – there were taxa in that genus that could not possibly belong together. I was very pleased to read a few years ago that DNA sequencing had shown some species that had been in the genus were closer to rusts than to other smuts. Just as being a “fungus” is more a life-style choice than an evolutionary relationship (for those who have not noticed, the fungi are now in two kingdoms) so it is that “smut” is a lifestyle, with some in the Ustilaginomycetes and others in the Urediniomycetes (“rusts”).

To start at the beginning of this book: over 20 years ago there was a meeting in Melbourne attended by many of the mycologists in Australia and ABRS arranged a meeting to sound out opinions about the Fungi of Australia project. They seemed shocked by two unpalatable facts: firstly there were a lot more Fungi than they realised and secondly the taxonomic mycologist was a

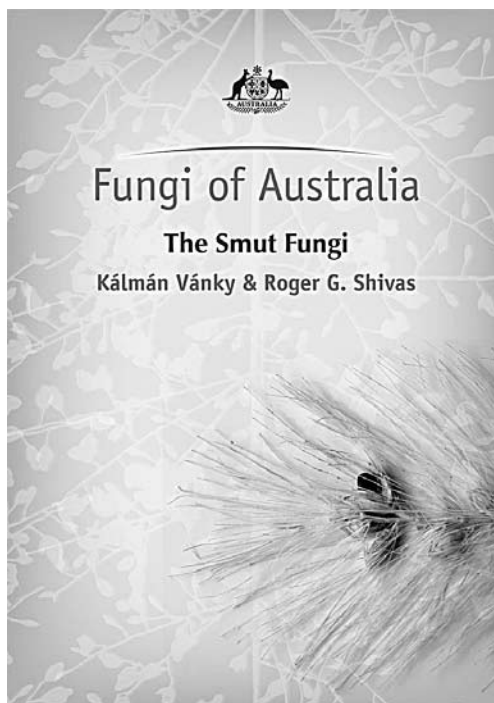
very rare and endangered species in Australia (and not much more common in the rest of the English speaking world). I thought that I was brave teaching students that the number of fungal species in an area was probably 4 times greater than the number of higher plant species and was miffed to find out that real mycologists thought the conversion factor was more like 6 or 8. So if ABRS was going to do the flora in 50 volumes, the fungi might need 300 to 400 volumes. I recall

some discussion about how many volumes could be produced by people living in Australia and there was a consensus that only a handful of volumes were possible (and only if ABRS got a move on before the relevant people retired and/or died).

The Fungi of Australia project has gone slowly: the first 4 introductory volumes (1A, 1B, 2A & 2B) came out between 1996 and 2003 and the initial taxonomic treatments in 2005 and 2006. This is the third taxonomic treatment (2008) and shows many of the peculiarities of the state of fungal taxonomy. It is a joint venture between the world expert on smuts (Kálmán Vánky, whose devotion to smuts is legendary) and a talented local (Roger Shivas, a

student of Langdon in Qu.). They acknowledge the assistance of 4 other authors, which goes a long way to explaining how this enormous undertaking was achieved.

Let me lead you into the significance of this book by comparing it with my well thumbed “The smuts of Australia” by McAlpine (1910) which lists 68 species in 10 genera placed in 2 families. We now have 296 species in 43 genera in 20 families in 7 orders in 2 classes. About half the species and 6 genera are endemic. The increased number of species reflects the slow accumulation of collections over the last 90 years and a recent burst of collecting activity by the authors. The



increased “depth” in the classificatory scheme reflects the impact of DNA sequencing on fungal classification and the rearrangements of old classifications in the light of the new data. In all, these smuts are parasitic on 488 host species in 179 genera and 32 families (mostly monocots). Most are on Poaceae (64%) or Cyperaceae (16%).

I now feel confident that when I revisit my old smut collections (last seen in a large herbarium cupboard in a room I have not visited in years), I will be able to put names on most of the specimens. Certainly, the specimens that I sent to taxonomists and ended up in formal herbaria now all appear to have been named and when I retire I should go through all the collections and check them out. I spent much time agonising over specimens collected from *Themeda* and was never happy about the names that appeared to be available for the taxa so it is pleasing to find out there are now even more taxa recorded than I thought that I observed. A “mystery” smut that turned up in a few collections from NSW and Qld in fragmentary form (never a specimen good enough to send away to a taxonomist) can probably be identified reliably today.

So, how have the names of Australian smuts changed in this new treatment? Some are unchanged (eg *Ustilago bullata*). Some changes are minor: the *Bothriochloa macra* smut has changed from *Sporisorium amphiphys* to *S. tenue* and the covered smut of *Austrodanthonia* spp is no longer *Ustilago readeri* but now *U. agropyri*. The exciting changes are the major ones, for example *Ustilago hypodytes* has shifted to the genus *Tranzscheliella*, which I find a relief as this taxon did not appear to belong with most other members of *Ustilago*. The largest shift is probably for our most distinctive smut, the ropey smut of *Austrostipa*. This beauty has gone from *Tolyposporium* to a new, monotypic endemic genus, *Fulvisporium*.

This volume is a neatly bound 267 pages of text (mostly species information) plus a CD containing a Lucid key for the taxa. As a first-time user of such a CD, I found it easy to use on my laptop. The book has only a few pictures, they are all stored on the CD so that for each species there are at least 3 images (gross morphology of sorus, teliospores under light microscope and SEM images of spore surfaces). The photos of freshly collected sori are usually excellent (in my experience, sori are very difficult to photograph and the photography here deserves an award), but old specimens in poor condition produce photos that are not very informative. If I was to start collecting smuts again, I guess that I would have to print out all the photos of sori and spores for more convenient reference in the field and next to the microscope. Overall, this volume sets new

standards for taxonomic works on fungi. On a nit-picking note, after several hours “playing” on the CD I found only one error: when I searched for smuts on *Austrodanthonia* nothing was returned, when I expected two species.

What is the use of this volume? Obviously, it will be invaluable to all smut researchers around the world. Such an up to date summary of the taxonomy of the Australian smuts has implications for the mycoflora all around the earth. For those interested in the conservation of biodiversity there are more taxa than you might expect that could be put on the list of endangered or extinct species. I counted at least 11 taxa that have not been collected for a very long time, despite the efforts of recent collectors. Several members of the genus *Urocystis* and a couple of *Thecaphoras* were last collected in the late 1800s or early 1900s. I have searched for *Ustilago. bromivora* on the native annual grass *Bromus arenarius* and *U. distichlidis* on *Distichlis distichophylla* in SA and Vic without success. When their host populations are reduced to low numbers and/or low density, it is easy for plant diseases such as smuts to go extinct. We may yet find that some of the old collections of smuts are all that remain of some species.

Is this volume the last word? No, because whilst the systematics of the higher levels has been put on a more solid base, the species level taxonomy is largely unresolved. Smut taxonomy has gone through a splitting phase, when nearly every smut on a different host species was called a different species, to a lumping phase when only taxa with clearly different sorus or spore morphologies are recognised as different species. When I used to grown smuts on artificial media, inoculate different host species to test for host range and use electrophoresis to study isozyme variation, it was clear that the lumping had gone too far. My studies on the *U. bullata/U. bromivora* group showed that there are probably several biological species found in Australia, but the situation appeared more complicated than simply a different smut species on each host. As another example, collections of ropy smuts (*Fulvisporium*) from NSW and SA from different *Austrostipa* species showed quite distinctive variations in growth habits when germinated and cultured on agar, so I believe that taxon is not monotypic. The likelihood of more smut species, especially in the taxa collected from multiple host species, is acknowledged in the text and should provide good starting points for DNA based studies at the species level in many taxa. I can dream that we may reach 1,000 species of smuts in Australia which could be about 0.5% of all the fungal species in Australia.

The final message to young taxonomists from this book is to learn DNA based procedures and take an interest in fungi, especially plant pathogens.

There are possibly 100,000 plant pathogens awaiting proper identification in Australia....

Roll on the Fungi of Australia project. At this rate, it will take more than a century, but this volume shows that they are setting a very high standard.

Eremophilas for Australian gardens

Colin Jennings

Leader, Eremophila Study Group
Association of Societies for Growing Australian Plants

***Australia's Eremophilas: changing gardens for a changing climate.* By N.Boschen, M.Goods, & R.Wait (authors & publishers). Consultant: Bloominings Books Pty. Ltd. Flexicover, 271pp: photo-illustrated, indexed; \$49.95 rrp. ISBN 978 1 876473 65 5.**

Available from: Private Bag 2197, Horsham, Vic 3400; eremophilas@skymesh.com.au; www.nativegrowth.com.au

Three amateur enthusiasts, each members of the Association of Societies for Growing Australian Plants (ASGAP)

Eremophila Study Group, have produced this book; having seen the need for growers of this diverse genus of Australian native plants to have available a resource which can be used both for photo-identification and a basis upon which to build their knowledge about cultivation and propagation.

They saw the opportunity to further promote the genus approximately two years ago when the Wimmera Growers Group was invited to host the F J Rogers Seminar, Eremophilas 2008, in Horsham in October 2008. Norma Boschen, Maree Goods and Russell Wait, using their own experiences and photographs, supplemented by assistance from a number of other enthusiasts, have produced a magnificent book. It will prove to be a valuable educational tool as well as being an attractive book, filled with photographs to be appreciated by expert and amateur alike.

Collating their immense knowledge of the genus through many years of personal involvement, both in the field and in their extensive gardens, they have pieced to together a valuable resource for all to appreciate and learn from. Not only

will this book be of value to hobbyists, but it will provide valuable information for landscapers and garden designers as well as being a resource which professionals can use – a very worthwhile supplement to Bob Chinnock's (2007) *Eremophila and Allied Genera*.

In the Foreword, Bob Chinnock, refers to the changing practices which need to be exercised by those who grow plants in their gardens and parks. He congratulates the authors for their forethought in producing the book and commends it to readers as a valuable source of information: a complete

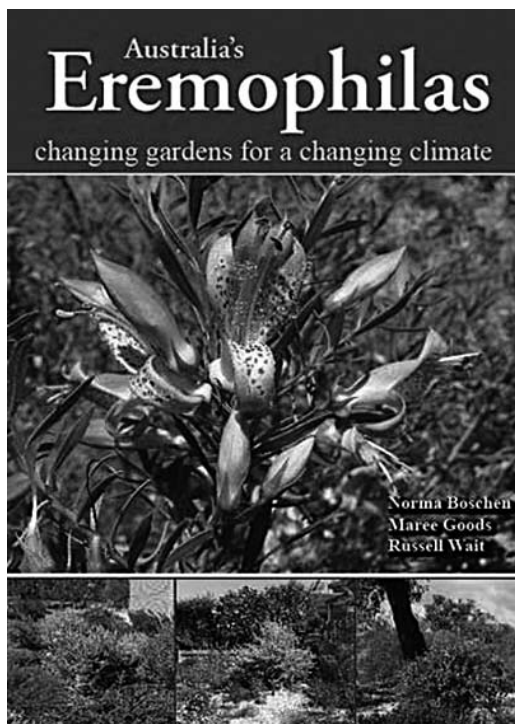
guide to the cultivation of *Eremophila*.

A brief history of the genus is presented. The question *Why Grow Eremophilas?* is posed; this is followed by the fundamental requirements of cultivation, propagation, and a brief review of pests and diseases as they relate to eremophilas.

The body of the presentation is conveniently divided into four sections, Small Trees and Large Shrubs, Medium Shrubs, Small Shrubs and Prostrate Shrubs; based on the 'habit' of the plant.

Within each section, species are accurately described and superbly illustrated. In most cases a full page treatment is given for each entry. A brief etymology treatment is given at the

beginning of each entry, followed by a compact, but comprehensive description with comments on the distribution of the species. Each species is discussed in detail with regard to its cultivation and growing hints are supplied. A summary is provided, giving the reader an overall perspective of the plant. In addition each taxon is illustrated by photographs, mostly taken in the garden, together with a detailed macro-view of individual flowers. Colour forms are often illustrated.



Overall the photographic record is excellent and will be a valuable tool for readers to be able to identify plants in their collections or seen in the field, without recourse to extensive keys or text references. Hybrid plants are to be found both naturally and in cultivation. Those which are now recognised as useful garden plants have been recorded, with a note that more will be used in the garden when they have been proven as horticultural subjects. Eremophilas of the future are recorded in the final chapter; species listed include several which are not currently in collections but could be in the future.

This publication is highly recommended, and from the number of books sold at the Seminar, it is already well established as a resource for those currently interested in this unique genus and will no doubt prove to encourage others to use these popular plants in their gardens.

Reference

Chinnock, R.J. (2007). *Eremophila and Allied Genera: A Monograph of the Myoporaceae*. (Rosenberg Publications, Kenthurst, New South Wales).

Revised edition of *Plant Names*

Tony Bean
Queensland Herbarium

***Plant names – A Guide to botanical nomenclature*. 3rd edition. By R. Spencer, R. Cross & P. Lumley. CSIRO Publishing, 2007. 162 pp., page size 215 x 147 mm. RRP AS\$39.95. ISBN 9780643094406.**

Confusion, annoyance, even anger. These are words that describe the feelings of gardeners and plant enthusiasts (and even botanists) when confronted with a name change to some well-known plant. I have heard on more than one occasion someone grumbling “you botanists spend all your time dreaming up name changes to make it hard for everyone else”. One hopes that such statements are tongue-in-cheek, but I’m sure some people believe that taxonomists have malicious intent when it comes to name changes.

The name-changes issue is just one of many covered by “Plant Names”, a wonderful small book that should be warmly welcomed onto our bookshelves. It is packed with information. On the back cover, the statement is made that the book is an invaluable guide to “botanists, publishers, professional horticulturalists, nurserymen, hobby gardeners and anyone interested in plant names”. An expansive claim, but I believe it to be true. There is something for everyone in this book.

The book is divided into four parts. The first covers the names of “wild plants”, those covered by the International Code of Botanical Nomenclature. There is a section on Common names, with an interesting analysis of their structural form, and the reasons why they should not be used as a substitute for botanical names. The book touches on the topic of the “invention” of common names, a practice that I find particularly distasteful. A common name, in my view, should be one that has achieved some spontaneous usage in the area of its occurrence, or where it has been cultivated. It should not be created by the authors of books or databases, and then enforced upon the unsuspecting public. The invention of common

names stems from the belief that every plant *must* have one, because “the public” is thought to be unable to cope with botanical names.

The brief section on the Botanical Code examines the main principles, but does not delve any further into the intricacies, although the later section entitled “Name changes” does give further insight into the problems that botanists may encounter in trying to determine the correct name for plants. A positive feature found throughout the book is the use of actual examples to illustrate the point being made, such as the reasons for the change from *Tristania conferta* to *Lophostemon confertus*.

The authors have defined the difference between misidentification and misapplication, clarifying for me something I had never really adequately considered.

Part 2 covers those cultivated plants that have been human-altered or are specially selected variants. In the book these are referred to by the useful, but little known term of cultigen. The naming of such plants is covered by the International Code of Nomenclature for Cultivated Plants (or Cultivated Plant Code for short). The nomenclature and terminology for cultigens really is complex and confusing, but Part 2 clearly and systematically explains it, and I for one will be using this book as a ready reference when dealing with the naming of cultivated plants. This chapter is essential reading for anyone considering entering the heady world of horticultural plant breeding. The authors give us a step-by-step procedure for introducing a new cultivar to the world, and steer us through a minefield of names, including Trade Designations, Trademarks, Cultivar names, and commercial synonyms.

Part 3 is devoted to the *use* of plant names, or in other words, the correct way to write them, *e.g.* where and when to use italics, inverted commas and the hybrid “x” symbol. This will be quite

straightforward for most of the readers of this newsletter, but again, the usage of names in cultivated plants is more complex and most of us would benefit by reading this account. The book does not delve into the complexities of botanical Latin, but it does explain about the gender of generic names, and hence why the ending of a species epithet often changes when transferred to another genus.

The short section on pronunciation is welcome, but the authors rightly admit that there is no general agreement on the pronunciation of many words in botanical Latin. What does it matter anyway as long as there is effective communication?

The fourth section of the book is a comprehensive list of plant name resources, *i.e.* book, journal and website references that deal with various aspects of plant naming. This list duplicates in part the "References" section at the rear of the book, but is nevertheless best kept apart because of the useful arrangement of resources according to subject and region.

An appendix at the rear of the book (headed Table 9) summarises all the categories of plant names that are discussed in the book, with examples and comments; this is a welcome addition as some of these are quite confusing. The final listing is a glossary of terms. I was surprised that some of the terms listed here are not listed in the index

e.g. diagnosis, illegitimate name, epithet, voucher specimen. In these cases, the reader, having been given a definition of a term from the glossary, is unable to easily access further discussion about it in the main text.

There are a few niggles or minor errors in "Plant Names":

Scattered throughout the book are a number of full-page photographs of various plant species. These are all of excellent quality, but I was left

wondering whether each photograph was somehow related to the nearby text. It seems they are not. This I found a little distracting.

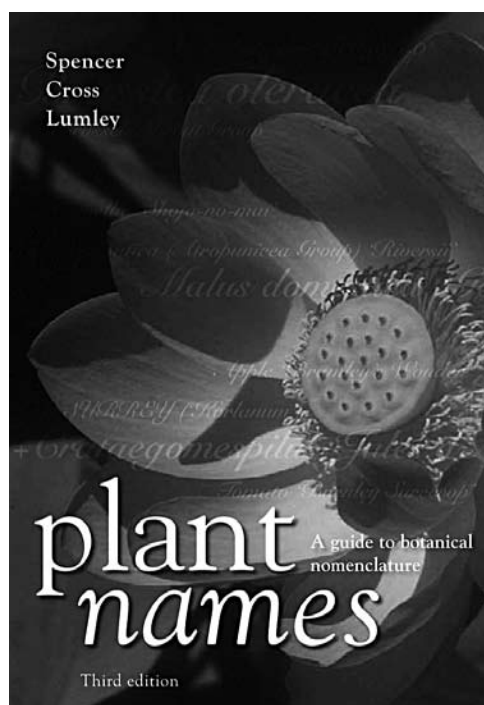
Some of the figures, particularly Fig. 11 and Fig. 18 are of limited value and do not assist the text.

The caption for Table 6 starts "Cultivars of woody plant genera registered ..." when the table clearly lists genera and not cultivars. It could perhaps have been reworded "Woody plant genera for which cultivars are registered ...".

The 4th edition of Stearn's 'Botanical Latin' is listed in the References section (p. 157), but the 3rd edition is listed in the Plant name resources section (p. 133).

Paul G. Wilson is given as first author of *Lophostemon confertus* (p. 97); this should be Peter G. Wilson.

But these are all minor things. In summary, I found the book to be well written, well constructed and dealing with its topic in comprehensive fashion. Everyone who reads it will learn something.



Exhibition

Lost gardens of Sydney

Lost gardens explores Sydney's rich and diverse gardening heritage. It traces the rise and fall of a number of Sydney gardens and garden styles, from the native bush and significant early colonial gardens, to nurseries and the gardens of the rising middle class, to the small domestic gardens of the inter-war years, to corporate roof-top gardens and threatened gardens of today.

The exhibition is rich with paintings, drawings, photographs, plans, statuary, floral albums and

botanical images. It is sponsored by the Australian Garden History society.

Where: Museum of Sydney

When: Saturday 9th August — Sunday 30th November, 2008.

Website: www.hht.net.au/whats_on/exhibitions/exhibitions/lost_gardens_of_sydney

See *Book notices* for the book associated with this exhibition.

Book notices

New books on orchids

Orchids of Western Australia. By Andrew Brown, Pat Dundas, Kingsley Dixon & Stephen Hopper. University of Western Australia Press, 2008. Hardback, 421 pp. RRP: \$89.95. ISBN: 978 0 980296 457

A doorstopper of a book, written by three of Western Australia's best known orchidologists and featuring copious delicate depictions of the orchids by botanical artist Pat Dundas.

Field guide to orchids of the Australian Capital Territory. By David Jones. National Parks Association of the ACT: Canberra. 2008. Paperback, octavo, 288 pp., colour photographs, other illustrations. AU\$40. ISBN: 9780980285420.

New book on banksias

Banksias. By Kevin Collins, Kathy Collins and Alex George. Blooming Books, September 2008. Hardcover, 384 pages, 233 x 152mm; over 400 illustrations in full colour. RRP: \$59.95. ISBN (10) 876473681 (13) 9781876473686. Available through www.bookwise.com.au.

South Australian wildflowers

Nature revealed: an artist's view of the wildflowers of South Australia. By Jan Woodman. Board of Botanic Gardens & State Herbarium, Adelaide and Department for Environment & Heritage, 2008. Softcover. 150 + ix pages, size; numerous plant paintings in full colour. ISBN 1921008822. RRP: \$49.90 plus postage and handling (Book sales at Adelaide Botanic Gardens, North Tce, Adelaide SA 5000).

New Ellis Rowan History

The flower hunter. The remarkable life of Ellis Rowan. By Christine & Michael Morton-Evans. Published by Simon & Schuster, April 2008. Paperback, 336 pages. RRP: \$34.95. ISBN-10: 0-7318-81285-9. ISBN-13: 978-0-7318-1285-1.

New botanic gardens of the world

Botanic Gardens. Nadine Monem (Ed.). Black Dog Publishing (2007). Hardback, 28 x 23 cm, 288 pages. 265 b/w and colour illustrations. \$129.50. ISBN 1904772722.

Another beautifully illustrated guide to the world's botanic gardens. A multi-authored volume

featuring 10 European and American contributors who have been involved in communicating aspects of gardens and gardening to the public for a number of years. For Australia only Melbourne and Sydney gardens are represented and most of the usual suspects are included, but there are a number from less documented countries such as Alaska, Romania, Turkey, Oman and Pakistan. There are essays investigating the history and future of botanic gardens as institutions of conservation and recreation.

Citrus and banana histories

Citrus: a history. By Pierre Laszlo. University of Chicago Press, November 2007. Hardcover: 262 pages; \$US25.00. ISBN-10: 0226470261. ISBN-13: 978-0226470269

Banana: The Fate of the Fruit That Changed the World. By Dan Koeppel. Publisher: Hudson Street Press, December 2007. Hardcover: 304 pages; \$US23.95. ISBN-10: 1594630380. ISBN-13: 978-1594630385.

Who owns what?

Who Owns Antiquity? Museums and the Battle over Our Ancient Heritage. By James Cuno. Princeton University Press, 2008. Cloth; 256 pp.; \$US24.95. <http://press.princeton.edu/titles/8602.html>

There's a lot of discussion lately over the return of antiquities such as the Elgin Marbles and the Rosetta Stone to their original countries and certainly there has been considerable return of items to Greece, Egypt and Italy. This book argues against their return. Should the Australian plant specimens hidden away in European herbaria be subject to the same considerations?

British Botanic Gardens

For those of you who missed the Travel section of *The Weekend Australian* of Oct. 11-12th there was also a lengthy account of Botanic Gardens in Britain (primarily Kew, Oxford, Cambridge, Edinburgh, Chelsea and the Eden Project, all of which are covered in the previously listed book) with discussion of their histories, functions and glasshouses.

www.theaustralian.news.com.au/story/0,25197,24461029-5002031,00.html

Lost Sydney gardens

Lost gardens of Sydney. By Colleen Morris. Published by Historic Houses Trust of New South Wales, 2008. Paperback, 160 pp., c.

170 colour illustrations. RRP: \$49.95. ISBN : 9781876991296.

"The gardens portrayed here are either lost or substantially gone. Some are on the brink of disappearing. Their loss highlights the importance of those that remain. The stories of Sydney's lost gardens are an entreaty for Sydney to cherish those that remain and to ensure the creation of new gardens that can provide pleasure and inspiration for generations to come." [From the preface].

This book is produced in association with an exhibition at the Museum of Sydney from 9 August-30 November 2008.

How naturalists worked in the 1800s

Imperial Nature. Joseph Hooker and the Practices of Victorian Science. By Jim Endersby. Published by University of Chicago Press, May 2008. 400pp, 49 halftones, 1 line drawing. Cost c. \$63. ISBN 9780226207919.

By analyzing Hooker's career, Endersby offers vivid insights into the everyday activities of nineteenth-century naturalists, considering matters as diverse as botanical illustration and microscopy, classification, and specimen transportation and storage, to reveal what they

actually did, how they earned a living, and what drove their scientific theories. What emerges is a rare glimpse of Victorian scientific practices in action.

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Science in the romantic age

The Age of Wonder: How the Romantic Generation Discovered the Beauty and Terror of Science. By Richard Holmes. Published by HarperCollins, October 2008. RRP: \$59.99. ISBN-13 9780 0071 4952 0.

A number of reviews in newspapers are available on the web and there is an interview with the author at www.abc.net.au/rn/bookshow/stories/2008/2361868.htm.

New SA National Parks Guide released

South Australia's National Parks Guide. Department for Environment and Heritage, July 2008. ISBN 978-1-921-446-24-3 64.

Download a specific area of interest or the whole publication:
www.environment.sa.gov.au/parks/resources/general.html#sanpg

Food for thought

On conferences: are they necessary?

The editorial in *Nature* of the week of 16th October asked whether scientific meetings or conferences are really necessary. Having previously surveyed a number of meetings that had been significant as the launching pads for new thinking and new projects, they questioned the value of the majority of conferences where such expectations are not realised? Why do we have conferences? Are they really necessary?

The power of face-to-face contact in generating new thinking, ideas, networks and collaborations cannot be underestimated. Moreover, increasing work and time pressures make it more important than ever to escape the daily grind and meet colleagues from around the world. Another function of scientific conferences is often to generate income for universities and learned societies, not to mention the profitable industry of conference organization.

While the first points are valid for the average ASBS member the last function is certainly not one that can be leveled at ASBS conferences at this time!

Concern was also expressed over the ever-increasing numbers of conferences although it is

anticipated that the present economic situation combined with projected rises in air travel may well provide a natural curtailment to the number of conferences in the future. The suggestion is made that the increase in conferences was more related to researchers padding their CVs (presumably as conference presenters and/or organisers) or to institutions clamouring to host events for the prestige rather than intellectual exchange. Many such meetings were seen as hastily organised and without a clear purpose. Again, not something that could generally be applied to ASBS conferences although there are certainly many more conferences about that the professional systematist might attend.

Having established that it is necessary to have a conference then it is suggested that organizers need to be clear about the meeting's aims and objectives and that the number and length of presentations could now be reduced since content is able to be circulated prior to the conference using online tools. This would also make content available to those unable to attend as would a live webcast of the conference proceedings. Reducing the time for presentations would leave more time for discussion and networking.

This was a timely editorial and for those involved in the next ASBS conferences in New England and New Zealand and the IBC in 2011 there is perhaps some food for thought.

Reference

Editorial. *Nature* 455, 836 (16 October 2008)
Available at www.nature.com/nature/journal/v455/n7215/full/455836a.html

On societies and the responsibilities of being a member

A second editorial with some warning messages for ASBS appeared in *Conservation Biology* recently. The Society for Conservation Biology was only founded in 1985 and so it is even younger than ASBS. The society shares some other attributes of ASBS, since members have successfully organised local chapters and working groups which coexist with their large and growing international meetings. Older members of ASBS will recall when each of the state chapters of ASBS held regular meetings and social functions – none of these chapters are now really functional, at least with respect to holding regular meetings.

Despite their youth the Society for Conservation Biology has produced an international journal since May 1987, described by its publisher as follows:

Conservation Biology has become the most influential and frequently cited journal in its field. *Nature* calls this title “required reading for ecologists throughout the world.” The journal continues to publish groundbreaking papers and remains instrumental in defining the key issues contributing to the study and preservation of species and habitats. (Web ref. 1)

Impact Factor for the journal in 2007 is cited as 3.934.

But this obviously successful society along with many others could well disappear in the future. Why? Because scientific societies are losing membership, and this loss of membership has been identified as being greatest amongst young professionals. Even if they have been captured once, students joining to attend meetings at a discount price or to gain some other advantage, do not renew their membership in subsequent years. Clearly without members the societies have only two options – become profit-making businesses or fold.

Much of the blame for this loss of membership is being placed on the electronic age. Scientific societies are in the business of dissemination of knowledge through meetings and publications. It is now often possible for that pool of potential new members (students) to access many journals electronically through their university library and

without any need to join a society. They can also establish contact directly via email with those who share their particular interests thus negating some of the needs for face-to-face networking at meetings.

So what are the benefits of membership? These are usually cited as:

- Information exchange whether by publications, workshops or meetings. Both the publications and the meetings are usually financially supported by the society and so declining membership has to place both in jeopardy.
- Collective representation. Systematics professionals promote systematics and that message is more likely to be listened to if it is promoted by a healthy, active society.
- Professional networking and recognition. The undertaking of roles within a society increases profile and contributes to the building of professional networks. Most societies provide various forms of recognition or awards for the taking on of these roles.
- Monetary. Members of societies usually get cheaper registration rates at conferences

In the case of ASBS there are extra incentives for students becoming members:

- Reduced membership fees
- Access to the Hansjoerg Eichler Research Fund
- Assistance to attend and present at ASBS conferences
- Eligibility for the Pauline Ladiges student prize

These are the benefits we may get from our society memberships. But many older ASBS members, established in their professions and paying full membership rates, no longer necessarily need the information exchange or professional networking aspects of the society. And they are not exposed to the incentives that are given to students. Yet they still remain members. Why? Presumably they do so because they believe in the society and its mission (in the case of ASBS the aim of the society is simply to promote systematics), they recognise a responsibility to a society that has provided them with opportunities and they recognise the value of acting collectively in the interests of their profession – that is, they do it because it is their duty and there may not be a future for their profession if they do not support their society.

Schwartz et al. would argue that this attitude needs to be passed on to students and the mentoring of students not only should include the teaching of best practice research and publication and the benefits of belonging to a society but also the obligations that membership of that society brings.

Society membership is an essential component of professional development. As such, membership is both a bargain and a responsibility. Help us promote an ethic of society membership as a professional responsibility. We call on all mentors to use their influence to teach the next generation of ...professionals the benefits and responsibilities that accompany professionalism and to guide them into membership of scientific societies. They are our future and they are needed.

References

- Schwartz, M.W., Hunter M.L. & Dee Boersma P. (2008). Editorial. Scientific societies in the 21st Century: a membership crisis. *Conservation Biology* 22: 1087-1089. Accessible through <http://www3.interscience.wiley.com/journal/121419959/abstract>
- Web ref. 1: www.blackwellpublishing.com/journal.asp?ref=0888-8892

A government's attempt to save one of the world's species-rich regions

An unprecedented proposal by the government of Ecuador is under threat. Known as the Yasuni-ITT initiative, the government proposes to combat climate change by keeping fossil fuels underground, thus keeping their part of the Amazon rainforest intact. The area concerned is mega-diverse and supports at least 2 indigenous tribes who maintain traditional lifestyles. In exchange for this, Ecuador is seeking

compensation in the form of half of the oil's projected revenue, some \$350 million per year for 10 years. However international donors have been slow to respond and the initiative appears to be headed for failure as the already extended deadline of December 2008 approaches.

Further background information can be found on numerous sites on the web, including those listed below.

References

- www.climateark.org/shared/alerts/send.aspx?id=ecuador_oil_underground <http://sef.umd.edu/sef2007.html>
- www.guardian.co.uk/environment/2008/oct/09/endangeredhabitats.endangeredspecies

Comparing the value of outputs across disciplines

For further discussion on impact factors and h-indexes for judging/comparing individual scientists and their outputs see the latest *Nature* where they discuss the outcomes of a paper that may make it possible to make comparisons across disciplines. None of these methods take account of the way that systematists publish and so the discussion is unlikely to be of any benefit to our discipline.

Web ref. www.nature.com/news/2008/081020/full/news.2008.1169.html#B1

Miscellanea

A botanical curiosity

Here's something that's amused Andrew Mitchell in Darwin. He has not tampered with it and it was found in natural circumstances.



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AD tel: (08) 8222 9307 fax: (08) 8222 9353 www.flora.sa.gov.au	HO tel: (03) 6226 2635 fax: (03) 6226 7865 www.tmag.tas.gov.au/Herbarium/ Herbarium2.htm	MEL tel: (03) 9252 2300 fax: (03) 9252 2350 www.rbg.vic.gov.au/ biodiversity/	NSW tel: (02) 9231 8111 fax: (02) 9251 7231 www.rbg Syd.gov.au/conservation _research/herbarium_&_services
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QRS tel: (07) 4091 8800 fax: (07) 4091 8888	MBA tel: (07) 4048 4745/4743 fax: (07) 4092 3593	NT tel: (08) 8951 8791 fax: (08) 8951 8790	<i>Australian University Herbaria</i> Contact CHAH representative: Murray Henwood, University of Sydney
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These listings are published in each issue. Please inform the Editors of any change

ASBS Publications

History of Systematic Botany in Australia

Edited by P.S. Short. A4, case bound, 326pp. ASBS, 1990. \$10; plus \$10 p. & p.

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

Systematic Status of Large Flowering Plant Genera

Austral.Syst.Bot.Soc.Nsltr 53, edited by Helen Hewson. 1987. \$5 + \$1.10 postage.

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*.

Australian Systematic Botany Society Newsletter

Back issues of the Newsletter are available from from Number 27 (May 1981) onwards, excluding Numbers 29, 31, 60-62, 66, 84, 89, 90, 99, 100 and 103. Here is the chance to complete your set. Cover prices are \$3.50 (Numbers 27-59, excluding Number 53) and \$5.00 (Number 53, and 60 onwards). Postage \$1.10 per issue, apart from \$1.75 for the Large Genera issue (Number 53).

Evolution of the Flora and Fauna of Arid Australia

Edited by W.R. Barker & P.J.M. Greenslade. Peacock Publications, ASBS & ANZAAS, 1982.
\$20 + \$8.50 postage.

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.

Also available from. Peacock Publications, 38 Sydenham Road, Norwood, SA 5069, Australia. (To obtain this discounted price, post a photocopy of this page with remittance).

Ecology of the Southern Conifers (Now out of print)

Edited by Neal Enright and Robert Hill.

ASBS members: \$60 plus \$12 p&p non-members \$79.95.

Proceedings of a symposium at the ASBS conference in Hobart in 1993. Twenty-eight scholars from across the hemisphere examine the history and ecology of the southern conifers, and emphasise their importance in understanding the evolution and ecological dynamics of southern vegetation.

Postage rates: Those quoted apply only within Australia. Please e-mail for prices to other locations.

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AUSTRALIAN SYSTEMATIC BOTANY SOCIETY INCORPORATED

The Society

The *Australian 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 January 1 each year.

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

The Newsletter

The *Newsletter* is sent quarterly to members and appears simultaneously on the ASBS Web site. 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 *Austral. Syst. Bot. Soc. Nsltr*

Contributions

Send to the Editors at the address given below. They *preferably* should be 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.

Formatting of submitted copy. Please use Word in formatting indents, bullets, etc. in paragraphs and for tables. Do not format primitively with tabs, which change with the Normal style sheet. If embedding tables or references or other Objects from other software (Excel, bibliographic software, etc.) ensure that these are converted to Word tables or paragraphs. Letters in abbreviations of Australian States (SA, WA etc., but Vic.) and organisations (e.g. ASBS, ABRIS) should not be separated by full-stops, but initials should be (e.g. W.R. Smith, not WR Smith).

Images: their inclusion may depend on space being available. Improve scanned resolution if printing your image is pixellated at a width of at least 7 cm (up to a 15 cm full page). Contact the Editors for further clarification.

The *deadline* for contributions is the last day of February, May, August and November. All items incorporated in the *Newsletter* will be duly acknowledged. Any unsigned articles are attributable to the Editors.

Authors alone are responsible for the views expressed, and statements made by the authors do not necessarily represent the views of the *Australian Systematic Botany Society Inc.* Newsletter items should not be reproduced without the permission of the author of the material.

Advertising

Advertising space is available for products or services of interest to ASBS members. The current fee is \$100 per full page, \$50 per half-page or less.

Flyers may be approved for inclusion in the envelope for products or services of interest to ASBS members. The current fee is \$100 per flyer, plus the cost of inserting them (usually roughly \$25-30). Flyers are not part of the *Newsletter* and do not appear with the *Newsletter* on the ASBS Web site.

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 flier. Contact the Newsletter Editors for further information.

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