

ASBS

*Australian
Systematic
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Society*



Newsletter

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ASBS INC BUSINESS

Minutes of the 22nd Annual General Meeting of the Australian Systematic Botany Society, Inc.

Held on Thursday 9th June, 2000 in Caley Seminar Room, National Herbarium of NSW, Royal Botanic Gardens, Sydney.

Meeting opened at 6.05 p.m. The President welcomed the 13 members present.

Apologies

Joy Everett, David Morrison, Barbara Wiecek, Murray Henwood, David Maberley, Kathie Downs, Bryan Simon, Surrey Jacobs, Elizabeth Brown, Kristina Lemson, Alex George.

Minutes of the 1999 Annual General Meeting

It was proposed that the minutes of the 21st Annual General Meeting (as published in the *Australian Systematic Botany Society Newsletter* Number 101) be accepted. Proposed: Tim Entwistle; seconded: Jenny Hart. Carried.

Business arising from minutes

There was no business arising from the minutes.

President's Report

Since the current council of *Australian Systematic Botany Society Inc.* was appointed in December 1999, this President's report covers less than six months. I would like to acknowledge the outstanding work of the last Council and sincerely thank each of them for the significant contribution that they have made. The current Council members look forward to assisting in the growth of the Society. Building on the achievements of previous Councils will do this.

A review of the Society's Constitution has highlighted a problem that requires resolution as soon as possible. In particular, the Council has recognised that the Society is not meeting its obligations under its "Name, Object and Rules of the *Australian Systematic Botany Society Inc.*" (namely, the Constitution) or the "Associations Incorporation Act 1991" (namely, the Act).

One of the important areas where the Society has failed to meet the requirements of the Constitution and the Act is that we have to hold the AGM within

five months of the end of the financial year. Unfortunately, this requirement means that the last seven AGMs were not constitutional. Therefore, ever since we were incorporated in 1993, the Society has not held constitutional AGMs. Since we are a small Society, with members scattered throughout Australia and Overseas, it has proved very difficult for us to satisfy this legal requirement.

There is also a legal requirement for the audited accounts of the Society to be lodged with the Registrar-General (in the A.C.T.) within 6 months of the end of the financial year. As a consequence of the AGMs being regarded as the deadlines, our failure to submit the audited accounts on time results in the Society incurring a late-fee. The penalty is currently set at \$200.

The Society is also non-compliant with the Constitution in the area of categories of membership. The Society has created "Institutional" and "Retired and unemployed" member categories but these have not been defined within the Constitution.

Council has agreed to review the Society's procedures and protocols as defined by the "Name, Object and Rules of the *Australian Systematic Botany Society Inc.*", in association with the "Associations Incorporation Act 1991" and other legislation referred to by this Act. It has been agreed to complete the following actions by the end of December 2000:

1. To complete the review of the Constitution
2. To comply with the Act
3. To develop guidelines for Council and subcommittees appointed by Council
4. To present recommendations to the Membership

Although the above issues are legally serious, I would like to stress that all previous Councils have been extremely diligent in applying the spirit of Constitution in all matters. Our aim is to satisfy the Constitution and the Act while ensuring the future development of the Society.

Treasurer's Report

Bill Barker presented the Treasurers Report in Elizabeth's absence.

Peter Wilson asked whether we needed to reapply for tax deductibility. Treasurer to check.

Karen Wilson pointed out the need to take out GST in the Eichler awards and suggested talking to the Linnean Society of NSW about this. She also intimated that there would be some money donated to the Eichler Research Fund from the Monocot Conference proceeds.

Peter Wilson asked about the strategy for managing the Eichler Fund, which could not be answered in the absence of the treasurer. Karen Wilson pointed out that the Linnean Society of NSW in the face of falling numbers and hence subscriptions, took out a fee from the Research fund for its administration.

Peter Jobson asked whether all merchandise had now been written off. This was thought to be the case, but to be checked with John Clarkson.

There seemed to be a mistake in the figures concerning the Conifer Books (\$20 return in 1999 seems odd in view of the \$60 price tag for this book). To be brought to the notice of the Treasurer.

Discussion centred about the increased costs of the newsletter, the figures for 1998 for 4 issues being similar to those of 1999 for only 3 issues and the 2000 figures for 3 Newsletters already exceeding those of both 1998 and 1999.

In view of the increased Newsletter costs the Treasurer recommended that subscriptions be increased to \$40 and \$20 for regular and student membership respectively.

Proposed: Bill Barker. Seconded: Karen Wilson. Carried unanimously.

Treasurer's Report for the 12 Months ended 31 December 1999

Presented to the Annual General Meeting, Sydney, 9th June 2000

Introduction

My apologies for not being present to personally deliver this report. Unfortunately I was committed to a trip to Lord Howe Island long before the date for this meeting was decided. Bill Barker agreed to give the report on my behalf.

I would like to thank the previous treasurer, John Clarkson, for his magnificent work during his period as treasurer. It is quite obvious, looking at the figures, how the finances of the Society have improved whilst in his care. We have experienced some difficulties in the handover between treasurers, the most significant being the auditor retaining all the books for a period of nearly six months (and the bank's inability to change addresses despite repeated requests).

The finances of this society are run on the calendar year so the figures being presented to you are for the year 01 Jan 1999 to 31 Dec 1999.

Membership

Fee	Full	Concessional	Gratis	Total
Ordinary	219 (71)	40 (9)	0	259 (80)
Student	NA	47 (29)	0	47 (29)
Institutional	11 (1)	NA	15	26 (1)
Life	NA	NA	1	1
Total	230 (72)	87 (38)	16	333 (110)

Table 1. Membership of Australian Systematic Botany Society 01 June 2000 (unfinancial members in brackets).

There has been a small increase in new members (seven, four of them students) and two members have resigned to go to other countries. Approximately one third of members are still unfinancial half way through the year. So late payment remains a problem, as does the static membership number.

General Fund

Income

The amount of interest the Society received in 1999 was significantly better than in 1998. As people will be well aware, rates have increased over the last 6 months and we can expect further improvement in 2000.

The trading statement for 1999 has shown a modest profit as the Society continues to divest itself of its stocks of books and merchandise.

Expenditure

When looking at the expenditure it should be noted that newsletters 100 and 101 (\$2847.30) were not paid for in 1999 and this should be considered when noting the surplus of \$2157.34. Furthermore, the three issues for 1999 cost almost as much as the four for the previous year and we would have run at a significant loss if four issues had been produced in 1999. Proposals to produce the Newsletter electronically for a proportion of the membership have the potential to reduce costs but until this is initiated and a subscription fee differential determined by Council it is vital to respond to the current situation. The current subscription does not cover costs and we are relying on the erratic income from conferences that we support.

The newsletter is now costing approximately \$1600 per issue to produce (\$6,400/annum). The effect of GST has yet to be felt but there will also be an increase in Newsletter costs as a result of this.

I believe the minimum increase required to cover increased costs in 2001 will be \$5 per subscription (Ordinary \$40, Student \$20). The latter amount would also allow us to recover the general increase in costs from the newsletter. The finances of the Society are sufficiently healthy to withstand any increased costs over the next six months but I do not recommend continuing this situation. On behalf of Council, I will be moving for an increase in Membership fees.

GST

The confusion is incredible and even at this late stage it is hard to know how GST is going to impact on us. We have applied for an Australian Business Number (ABN) but have not applied to be registered

for GST. This was done on the basis of advice from an Australian Tax Office official who stated quite clearly that he was not allowed to advise us not to apply for registration. The gist of his advice was that while registration would allow us to reclaim the increased costs of postage and printing of the newsletter we would also have to charge GST on membership fees, student grants, workshops and grants to conferences etc. It doesn't take much financial acumen to realise we would be paying out more tax than we were gaining in tax relief.

The situation will be kept under review.

Current Assets in the General Fund

The Society held at the close of 1999 assets of \$37,589 (\$36,569 in cash, \$1,040 in books).

Research Fund

The Research Fund continues to show healthy growth. Net assets increased from \$84,957 to \$112,462 in the twelve months ended 31st December 1999, more than partly due to a large donation of \$20,000. Three grants totalling \$3,000 were awarded in 1999 (although included in the 1999 accounts this money was not paid out until early 2000). Applications for this year's grants will be called shortly and close at the end of August.

Funds are invested in a range of investment products managed by Commonwealth Investment Services, a wholly owned subsidiary of the Commonwealth Bank of Australia. It will be necessary to talk to the Bank advisors about how the money should be placed for best returns (and reliability) in the current economic climate.

Summary

The Society holds substantial assets but the cost of producing the Newsletter has the potential to rapidly reduce these funds unless membership fees are increased. Alternative methods of publication need to be investigated. The impact of GST needs to be monitored over the coming year.

Elizabeth Brown, Honorary Treasurer

AUSTRALIAN SYSTEMATIC BOTANY SOCIETY INCORPORATED

COMMITTEE MEMBERS' REPORT

Your committee members submit the financial statement of the Australian Systematic Botany Society Incorporated for the financial year ended 31 December 1999 (with limited information for the part-financial year 1 January 2000 – 7 June 2000).

Committee Members

The names of the committee members who held office throughout the year and at the date of this report are:

Robyn Barker	Secretary
Bill Barker	Appointed Dec 1999
Elizabeth Brown	Treasurer Appointed Dec 1999
Barry Conn	President Appointed Dec 1999
Kristina Lemson	Appointed Dec 1999
Bob Makinson	Appointed Dec 1999

Andrew Lyne	Public Officer
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Principal Activities

The principal activities of the association during this first half of the financial year were to promote systematic botany in Australia

Significant Changes

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

Operating Result

The surplus for the year ended 1999 amounted to \$28,306 (1998 : \$22,890)

	Until 7 June 2000	1999	1998	1997
	\$	\$	\$	\$
Research Fund	n.av. ¹	26,149	22,110	10,134
General Fund	n.av.	2,157	780	(1,705)
		28,306	22,890	8,429

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

B. Conn (President) E. Brown (Treasurer)

Dated this 7th day of June 2000

¹ n.av. = not available. Since the accounts for 1999 have not been returned from the auditors many financial details are not available at this stage

STATEMENT OF INCOME AND EXPENDITURE

1997-2000

RESEARCH FUND

	Until 7 June 2000	1999	1998	1997
Income				
Donations to Research Fund	485	25,647.08	20,365.00	10,175
Investment income	n.av.	3,511.06	3,476.88	1,968
50% of profits from sales	0.00	0.00	523.00	0
		29,158.14	24,364.88	12,143
Expenditure				
Research Grants	0.00 ²	3000.00 ²	2,250.00	2,000
Bank Charges	n.av.	8.50	4.50	8
		3008.50	2,254.50	2,008
Surplus (Deficit) for year		26149.64	22,110.38	10,134

STATEMENT OF INCOME AND EXPENDITURE

1997-7 June 2000

GENERAL FUND

	Until 7 June 2000	1999	1998	1997
Income				
Sales				
Merchandise	n.av.	128.00	788.00	258
History books	269.50	690.00	1,000.00	515
Arid Australia books	0.00	0.00	60.00	185
Conifer books	n.av.	151.95	420.00	192
		969.95	2,268.00	1,150
Less cost of goods sold				
Opening stock - merchandise	n.av.	502.00	1,319.00	2,565
Opening stock - books	n.av.	1,195.00	2,365.00	2,762
Closing stock - merchandise	n.av.	0.00	(502.00)	(1,319)
Closing stock - books	n.av.	(1,040.00)	(1,195.00)	(2,365)
		657.00	1,987.00	1,643
Gross Surplus (Deficit) from Trading		312.95	281.00	(493)
Advertising	50.00	318.39	100.00	0
Conferences	3120.70 ³	0.00	12,225.32	1,450
Investment income	n.av.	1,336.42	1,034.81	1,441
Subscriptions to ASBS Inc	6285.00 ⁴	9,075.00	8,080.00	11,260
Postage recovery	n.av.	143.04	69.60	0
Sundry income	n.av.	110.07	7.50	20
Total Income		11,295.87	21,798.23	13,678

² 1999 Grants paid in 2000. Note: no grants as yet awarded for 2000.

³ Dampier Conference (\$3120.70, including initial refund of \$1000 advance)

⁴ Approximately 1/3 of membership are late in paying dues for 2000

Expenditure				
Auditors remuneration	n.av.	550.00	375.00	300
Bank fees	40.01	51.19	47	
Conference expenses	2500.00 ⁵	965.00	3,750.00	3,150
Filing fees	n.av.	0.00	30.00	60
General expenses	n.av.	15.00	12.00	20
Meeting expenses	0.00	1,095.00	1,399.80	928
Newsletter expenses	4777.00 ⁶	4,133.74 ⁷	4,219.75 ⁸	4,697 ⁸
Postage & stationary	n.av.	87.10	110.95	25
Royalties - history book sales	n.av.	1,123.68	342.43	5,058
Subscriptions (FASTS) ⁹	0.00	864.00	2,043.00	1,098
Transfer to Research Fund	0.00	0.00	523.00	0
Monocot field trip	0.00	0.00	8,161.46	0
Newsletter Printing back issues	0.00	265.00	0.00	0
		9,138.53	21,018.58	15,383
Surplus (Deficit) for year		2,157.34	779.65	(1,705)

⁵ Advances to Legume Conference \$2000 and Investigator 200 Conference \$500

⁶ 3 issues of Newsletter - covering issues 100, 101 & 102

⁷ 3 issues of Newsletter - covering issues 97, 98 & 99

⁸ 4 issues of Newsletter

⁹ Subscription to FASTS will increase in 2000 from \$4.50 to \$5.00

BALANCE SHEET AS AT 31st DECEMBER 1999
(figures to 7th June 2000 given where available)

	Until 7 June 2000	1999	1998	1997
Current Assets				
Cash and Investments				
Research Fund				
Cash at bank	n.av.	694.44	21,264.77	1,518
Investments				
Cash Management Fund	n.av.	22,412.01	0.00	0
Australian Bond Fund	n.av.	41,439.51	40,797.97	39,128
Growth Fund	n.av.	47,916.26	22,893.86	19,718
		112,462.22	84,956.60	60,365
General Fund				
Cash				
Cash at bank	n.av.	2,470.49	2,077.63	5,494
Term Deposit A	n.av.	10,000.00	10,000.00	10,000
Term Deposit B	n.av.	5,535.36	5,335.96	5,159
Investments				
Cash Management Account	n.av.	18,563.87	16,341.79	10,336
		36,569.72	33,755.38	30,989
		149,031.94	118,711.98	91,353
Inventories				
General Fund				
Merchandise	n.av.	0.00	502.00	1,319
History of Systematic Botany	n.av.	1,020.00	1,195.00	2,165
Conifer Books	n.av.	20.00	0.00	200
		1,040.00	1,697.00	3,684
Total Current Assets		150,071.94	120,408.98	95,037
Net Assets		150,071.94	120,408.98	95,037
Members' Funds				
Research Fund				
Accumulated surplus at end of year	n.av.	105829.83	79,680.19	57,570
Asset Revaluation Reserve	n.av.	6632.39	5,276.41	2,795
		112462.22	84,956.60	60,365
General Fund				
Accumulated surplus at end of year	n.av.	37609.72	35,452.38	34,673
Total Members' Funds		150,071.94	120,408.98	95,037

**NOTES TO AND FORMING PART OF THE ACCOUNTS
FOR THE YEAR ENDED 31 DECEMBER 1999**

1. Statement of Significant Accounting Policies

This report is a special purpose financial report in order to satisfy the financial reporting requirements of the Associations Incorporation Act (ACT). The committee has determined that the association is not a reporting entity.

The financial report has been prepared in accordance with the requirements of the Associations Incorporation Act (ACT).

No Australian Standards, Urgent Issues Group Consensus Views or other authoritative pronouncements of the Australian Accounting Standards Board have been intentionally applied.

The financial report has been prepared on an accruals basis and is based on historic costs and does not take into account changing money values, or except where specifically stated, current valuations of non-current assets.

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 association is exempt from income tax accordingly no provision has been made in the accounts.
- (c) **Asset Revaluation Reserve**
Revaluations of assets are transferred to the Asset Revaluation Reserve.
- (d) **Comparative Figures**
Where required by Accounting Standards comparative figures have been adjusted to conform with the changes in presentation for the current year.
- (e) **Members Funds**
In accordance with the rules of the association accumulated funds are not available for the distribution to members.

	1999	1998	1997
2 Investment Income			
Research Fund			
Interest Received			
Cheque account	17.09	1.63	436
Distributions			
Cash Management Trust	186.01	0.00	0
Australian Bond Fund	1,780.42	2,743.00	856
Growth Fund	1,527.54	732.25	676
	3,511.06	3,476.88	1,968
General Fund			
Interest Received			
Cheque account	7.62	10.57	307
Term deposits	606.72	518.19	799
	614.34	528.76	1,106
Distributions			
Cash Management Trust	722.08	506.05	336
	1,336.42	1,034.81	1,441
	4,847.48	4,511.69	3,409

3 Accumulated Funds

Research Fund

Accumulated surplus (start)	79,680.19	57,569.81	47,435
Surplus / (deficit) this year		22,110.38	10,134
Accumulated surplus (end)		79,680.19	57,570

General Fund

Accumulated surplus (start)	35,452.38	34,672.73	36,377
Surplus / (deficit) this year	2,157.34	779.65	(1,705)
Accumulated surplus (end)	37,609.72	35,452.38	34,673
		115,132.57	92,243

4 Reserves

Research Fund

Asset Revaluation Reserve

Balance at beginning of year	5276.41	2,794.94	0
Transfers this year	1355.98	2,481.47	2,795
Balance at end of year	6,632.39	5,276.41	2,795

5 Members of the Committee

The names of the committee members who have held office during the financial year are:

Robyn Barker	Secretary
Bill Barker	Appointed Dec 1999
Elizabeth Brown	Treasurer Appointed Dec 1999
John Clarkson	Treasurer retired Dec 1999
Barry Conn	Vice President President Appointed Dec 1999
Tim Entwisle	President retired Dec 1999
Kristina Lemson	Appointed Dec 1999
Terry Macfarlane	Councillor retired Dec 1999
Bob Makinson	Appointed Dec 1999
Peter Weston	Councillor retired Dec 1999

6 Research Committee

The Australian Systematic Botany Society is an approved research institute.

The approved membership of the Research Committee comprises:

- Terry Macfarlane
- Peter Weston
- Barry Conn
- Robyn Barker
- John Clarkson
- Tim Entwisle

INDEPENDENT AUDIT REPORT TO THE MEMBERS

Scope

We have audited the accompanying financial statements, being, a special purpose financial report comprising the Statement by Members of the Committee, Statement of Income and Expenditure, Balance Sheet and notes to and forming part of the financial statements *Australian Systematic Botany Society Incorporated* for the financial year ended 31 December 1999. The committee is responsible for the financial report and have determined that the accounting policies used are appropriate to meet the needs of the Associations Incorporations Act (ACT) and the needs of members. We have conducted an

independent audit of this financial report in order to express an opinion on it to the members. No opinion is expressed as to whether the accounting policies used, and described in Note 1, are appropriate to the needs of the members.

The financial statements have been prepared for the purpose of fulfilling the requirements of the Associations Incorporation Act (ACT). We disclaim the 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 for which it was prepared.

Our audit has been conducted in accordance with the Australian Auditing Standards. Our procedures included examination, on a test basis, of evidence supporting the amounts and other disclosures in the financial report, and on 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 Australian Accounting Standards and other professional reporting.

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

Qualification

As is common for organisations of this type, it is not practicable for the association to maintain an effective system of internal control over the receipt of revenues until their initial entry in the accounting records. Accordingly, our audit was limited to the amounts recorded.

Qualified Audit Opinion

Subject to the above qualification, in our opinion, the financial report presents fairly in accordance with the accounting policies described in Note 1 to the financial report the financial position of the Australian Systematic Botany Society Incorporated as at 31 December 1999 and the results of its operations for the year then ended.

Harvey & Colleton Accountants
04 July 2000

Membership

Life Membership: the president announced that Council had approved the nomination of Dr David Symon as a Life Member for his substantial and continuing contribution to the Society at both the chapter and national level. An event would be organised to mark this occasion at a later date, probably in Adelaide.

The following new members were welcomed to the Society

Dr Reed Beaman Royal Botanic Gardens, Sydney

Ms Ann Bohte School of Botany, Melbourne University

Ms Gillian Brown School of Botany, Melbourne University

Ms Michelle Casanova RMB L620 Westmere 3351

Ms Nikola Streiber 11A Pemell St, Enmore 2042

Membership Drive

Bill Barker appealed for ideas from the floor on how to get both new members and retain existing. Jim Mant suggested that un-financial members do not mind being chased up, particularly if it gave them an easy way to pay the subscription.

Peter Weston suggested increasing the membership by broadening the range of people who might join the Society. When speaking to different groups advertise the Society.

Karen Wilson pointed out the lack of a poster advertising the Society, a matter that Council is presently addressing. A brochure is in the planning stages.

Peter Jobson commented that he had tried to encourage Technical Officers to join but the Newsletter was not attractive to them.

Bob Makinson suggested that the Newsletter was probably not the main interest of the members but it was important to have chapter activities. He commented on the desirability of a book network, enabling cheaper purchase of books to members.

Peter Weston suggested lower registration at conferences for members, a suggestion, which had already been made within Council.

Newsletter Report

The editor, Bob Hill indicated that there were no problems with production of the Newsletter but the completion and mailing out were a problem. Web versions of 1998 and 1999 newsletters need to be made available for projection on the web. Some discussion was held on whether or not the subscription to ASBS should be reduced for those members choosing to take the Newsletter electronically. Opinions varied as they have when this matter has been raised in the past and the matter has yet to be resolved.

Eichler Research Fund

Nominations for Eichler awards to be called for starting June. Closing date is August 31st. The same subcommittee as last year will judge the year 2000 applications.

Society Meetings

- 2001 July - Canberra: International Legume Conference (Mike Crisp)
2001 Sept. - Sydney/Cairns 5th International Flora Malesiana Symposium (AGM to be held in association with this meeting)
2001 Investigator 200 (Albany: Alex George)
2002 Robert Brown and associates bicentenary/?Botanical Society of Korea
2003 Melbourne (Jim Ross/Marco Duretto)

An advance has been made to the International Legume conference in July 2001 and to the Western Australian *Investigator 200* celebration in Albany at the end of 2001.

There is a need to work out ASBS involvement in the Flora Malesiana conference in September 2001 and also to stay in touch with the diversity of happenings surrounding the Matthew Flinders/Baudin bicentenary.

Palynological and Palaeobotanical Association of Australasia (Australian Branch): A proposal that the PPAA become a specialist group under the auspices of ASBS continues to be progressed in consultation with Bob Hill.

Other business

Historical Associations meeting (Rod Page workshop)

Peter Weston was thanked for his role in organising the workshop, Rod Page for giving the workshop, the participants for their attendance and the National Herbarium of NSW for providing a venue. The workshop was deemed a success by all who attended and the registration fees covered ASBS costs.

Election Results

The number of nominations received was the same as the number of vacancies and no election was necessary. The following members have been elected to the positions indicated and took office from the end of the AGM.

President	Barry Conn
V/President	Bill Barker
Treasurer	Elizabeth Brown
Secretary	Robyn Barker
Councillors	Bob Makinson & Kristina Lemson

Meeting closed at 7.30 p.m.

Life Membership awarded to Dr. D.E. Symon

Dr David Symon was nominated for life membership of the Australian Systematic Botany Society this year for his substantial and continuing contribution to the Society at both the chapter and national level. Council approved the nomination and David became our second Life member at the AGM in June. The nomination included a list of David's contributions to the Society at both the chapter and state level, most of this information being recorded in an earlier newsletter (see *ASBS Newsletter* 90 (1997) 32-4) on the occasion of David being granted a D.Sc. by the University of Adelaide.

David continues to work in the State Herbarium of South Australia as an Honorary Research Associate. He usually appears on at least 3 days a week, mostly on his bike and in his distinctive helmet. His enthusiasm for his many interests, including botanical matters, remains undiminished although he is not quite so enthused by computers. He has never been afraid to tackle the difficult groups (e.g. *Senna* of the past and presently *Rubus* (Rosaceae)). He works co-operatively with students doing DNA studies, has been involved in the project

to develop a LucID key to Solanaceae, identifies vast numbers of specimens from the Biological Surveys each year and maintains contact with numerous specialist botanists both within Australia and overseas. For some years he was one of three judges for the non-fiction award for Adelaide Writers Week, a job entailing the reading and judgement of up to 300 new books in a relatively short space of time. He continues to lecture to the University of the Third Age on botanical matters, continues to guide walks in the Waite Arboretum and has more recently been involved in collecting information and ephemera on the Sturt Pea in his spare time. More importantly he continues to bring an infectious enthusiasm to his chosen field of learning and loses no opportunity in educating those around him. Although our numbers are few in the South Australian Chapter, David is a regular attendee and valued participant in our monthly meetings.

In the last month or so David has received a setback to his health which we hope will be temporary. Despite having treatment he has still appeared at the

Plant Biodiversity Centre regularly and at my request found time to make some notes on his professional life, dug out some old letters and compiled a list of his collecting activities. For those of you who have not met David the information below will hopefully provide you with an insight of why we value him so much. Even those of you who do know David may learn something. Extracts from his letters, written on field trips in the '60's and '70's and reproduced below, reveal just how much so many things have changed as well as some of the "common" experiences of those who chase plants about the bush.

David celebrates his 80th birthday in October. I am sure that all members of the Society would want to wish him well on this occasion and to extend their congratulations for the awarding of his well deserved life membership of the Society.

Robyn Barker

[Robyn has provided quite a bit of material about David Symons' career. There is not enough space in this issue to reproduce all this material, but it will appear in the December newsletter – ed.]

Record line-up in 2001 Eureka Prizes

The Australian Museum is proud to announce the launch of the 2001 Eureka Prizes - Australia's pre-eminent national science awards.

The 2001 series is the biggest ever, with three new prizes – for biodiversity research (sponsored by the Royal Botanic Gardens Sydney), for a science book (sponsored by Reed New Holland) and for earth, environmental and planetary sciences in secondary schools (sponsored by Macquarie University). Other Prizes cover environmental and scientific research and journalism, environmental education programs, industry commitment to science, critical thinking, engineering innovation, secondary school biological sciences and promotion of science.

With a record thirteen prizes on offer worth over \$120,000, the Eureka Prizes are now the most comprehensive science awards in Australia. They are a unique cooperative partnership between the federal government, the NSW state government, educational institutions and a range of private sector organisations and companies designed to raise the profile of science in the community.

The vitality of the Prizes relies on the efforts of people and organisations across Australia in identifying suitable candidates for these prestigious awards. Your help in both promoting the Prizes, and in entering/nominating candidates, will ensure that the Eureka Prizes continue to highlight Australia's outstanding scientific and technological achievements.

Entries/nominations close on Friday 9 February 2001, with the winners announced at an award ceremony at the Australian Museum on 15 May 2001 and profiled on Quantum, ABC TV's award-winning national science program, on 17 May 2001. Further details and entry forms on all Prizes are available from the Australian Museum's webpage at www.austmus.gov.au/eureka or from 02 9320 6230.

Roger Muller
Australian Museum

“Compiled by a virtual who’s who in the field of conservation science, the Encyclopedia of Biodiversity highlights the critical importance of biodiversity and illustrates why all thinking people should care about stemming the loss of our natural heritage.”

- John Sawhill, President and CEO, The Nature Conservancy

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(Five Volume Set)

Editor in Chief

Simon A. Levin

Princeton University, Princeton, New Jersey

*Look out for
the review in
the next issue
of ASBS*

First used in 1980, “biodiversity” describes the abundance, variety, and genetic constitution of native animals and plants, and has been linked with politics and environmental technology. The science of biodiversity has now become the science of our future, increasingly influencing important international agreements, conventions, conservation initiatives, political debates, and socio-economic implications. Our awareness of the loss of biodiversity has brought a long overdue appreciation of the issues and created a determination to develop the tools to protect our future.

Scheduled for release in Sept/October 2000 the Encyclopedia brings together for the first time a study of the dimensions of diversity, an examination of the services biodiversity provides, and measures to protect it. Major themes of the work include the evolution of biodiversity, systems for classifying and defining biodiversity, ecological patterns and theories of biodiversity, and assessment of contemporary patterns and trends in biodiversity.

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ABRS REPORT

Staffing and restructure

Elsewhere in this newsletter is a report from the Acting Director of ABRS, Dr Geoff Dyne, on the main features of the recently completed restructure of ABRS. The main features of this from a botanical point of view are:

- The ABRS Editorial Committee has been disbanded, with some of its functions taken over by the ABRS Advisory Committee.
- The old Flora Section of ABRS is no more. In its place are a series of subprograms, each of which reports directly to the Director ABRS.
- The delivery of ABRS 'publications' will become increasingly electronic, as part of the Commonwealth Government's "Government On Line" policy. In the case of *Flora of Australia* and its sister series, this will mean that all text and illustrations must be delivered via the Web as well as in hard copy. We will implement this directive by expanding ABIF-Flora, linking descriptive and illustrative material to APNI, and possibly to other botanical information systems.
- Increased emphasis (and resources) will be given to cryptogam, algal and fungal groups, and a corresponding reduction in resources will be available for the vascular flora.
- Enquiries about various aspects of the old Flora program will in future need to be directed to a range of ABRS staff instead of to the Director, Flora (a position which no longer exists).
 - Vascular flora enquiries should be addressed to Tony Orchard or Annette Wilson.
 - Bryophyte enquiries should be addressed to Patrick McCarthy.
 - Lichen enquiries should be addressed to Patrick McCarthy.
 - Algae enquiries (including *Algae of Australia*) should be addressed to Tony Orchard.
 - Fungi enquiries (including *Fungi of Australia*) should be addressed to Cheryl Grgurinovic.
 - Electronic publication enquiries, including ABIF-Flora, should be addressed to Helen Thompson.
 - Enquiries relating to the Grants program, financial management of contracts, and

Biologue, should be addressed to Liz Visser.

- Enquiries relating to general policy, broad strategic matters, and organisational concerns should be addressed to the Director, ABRS (Acting Director at present is Geoff Dyne).
- Katy Mallett will float as an Editorial Assistant between the above Subprograms.
- Jane Mowatt's position has been declared excess (one of three lost by ABRS), and she will transfer to some other part of Environment Australia.
- The permanent position of Director, ABRS, has been advertised, and interviews should take place in late September.
- ABRS has been moved to a new Branch within Environment Australia, as part of a new departmental structure announced a couple of months ago. From the end of October, ABRS will be part of Parks South, in the same Branch as the Australian National Botanic Gardens and the Centre for Plant Biodiversity Research. The Branch Head (Assistant Secretary) is Mr John Hicks.
- ABRS subprogram leaders will be required to actively seek out opportunities for cooperative ventures and partnerships, to supplement activities funded from the core budget. These cooperative ventures and partnerships are expected to involve a broadening of the client base which ABRS will service.

Publications

Flora of Australia Supplementary Series No. 10, *Floodplain Flora: A flora of the coastal floodplains of the Northern Territory, Australia*, was published on 11 September 2000 (heralded in the March ASBS Newsletter, but delayed by printing problems). The book was compiled by Ian Cowie and Philip Short (with contributions from Bill Barker, Clyde Dunlop and Greg Leach), illustrated by Monika Osterkamp Madsen, and edited by Katy Mallett. It is jointly published by ABRS and the Parks & Wildlife Commission of the Northern Territory.

The seasonally inundated, coastal floodplains of the Northern Territory are the largest of their kind in Australia. This book is primarily an identification tool for the floodplain flora, which provides shelter and is the primary food source for

the rich animal diversity. An introductory essay discusses the natural history, ethnobiology and management and conservation issues of this important ecosystem.

The book provides the first comprehensive account of the plants of the coastal floodplains and will be invaluable to naturalists, biodiversity managers, biologists and all visitors to the Top End — that part of the Northern Territory north of about Mataranka. It will also be useful in adjacent parts of Queensland and Western Australia.

The main part of the volume consists of descriptions, illustrations and keys to enable identification of the more than 300 species of plants that grow on the floodplains. It will also be of use in identifying plants that occupy seasonal or permanent billabongs and lagoons of the Top End of the Northern Territory, as it includes an account of almost all fully aquatic plant species in the Territory, including those not found on the floodplains.

There are 89 full page black and white figures, 84 of them being carefully executed line drawings illustrating 328 taxa, and 14 additional pages of colour photographs.

The book is available from ABRS (Publications), GPO Box 787, Canberra ACT 2601, for \$66, including GST and postage. Payment can be made by cheque (made out to 'Collector of Public Monies'), Bankcard, Visa or Mastercard (supply the usual details).

Changes at the Australian Biological Resources Study (ABRS)

ABRS has been undergoing a significant re-ordering of its priorities and structure. To remain relevant and effective, a long-standing program such as ABRS needs to be responsive to changes in its client base and their expectations, as well as to government priorities. The current adjustments follow a Departmental assessment of ABRS' existing capabilities and the perceived need to position the program to confront the nation's taxonomic impediment more aggressively and to deliver high-quality taxonomic information to biodiversity professionals and other clients in a more focussed and efficient manner.

Publications in preparation

The restructure of ABRS has necessitated a re-ordering of priorities and publication timetables, a process still in progress. In the next couple of months authors of those volumes previously scheduled for publication in the next 5 years will be contacted, with details of the proposed new publication schedule. The following core publications are expected to appear in the next 6–9 months.

Flora of Australia Vol. 11A Acacia 1.
Flora of Australia Vol. 11B Acacia 2.
WATTLE: An interactive key to Australian Acacia species.
Flora of Australia Vol. 43 Poaceae 1.
Interactive Key to Australian Grasses.
Flora of Australia Vol. 58A Lichens 3.

Five non-core publications are in preparation and should appear during 2000/2001:

101 Forest Fungi An interactive key to some macrofungi of SE Australian forests (joint publication with Knowledge Books & Information Systems).
Marine Plants of Australia (joint publication with University of Western Australia Press).
Allan Cunningham's Collecting Localities during the King Coastal Survey.
Nature's Investigator: The Diary of Robert Brown in Australia, 1801–1805.
Moss Flora of Norfolk Island.

Tony Orchard
ABRS Vascular Flora & Algae

Electronic publishing to become the standard
One of the central objectives of ABRS—to document and disseminate information on the biota—is, we believe, now best served by a progressive move to electronic publishing, both through the medium of CD-ROM/DVD and that of the World-Wide Web. Most of ABRS' products are reference works, with the majority of users requiring only selected subsets of information at any given time. Web-publishing allows access to a much wider audience, who should be able to search more effectively for specific material and extract it as required. The prospect of broader client reach, easy updating, and rapid feedback makes this form of delivery an attractive proposition. CD-ROM (and eventually, DVD)

products provide a convenient and readily transportable store of information and also allow ABRs to cater to the burgeoning interest in interactive keys.

While demand persists, the *Flora of Australia* will also continue to be produced in paper form. The first of a new series, the *Algae of Australia*, is also in production, as are further volumes of the *Fungi of Australia*. These will initially be produced in both electronic and hard-copy.

Last year, ABRs launched the Australian Biodiversity Information Facility (ABIF) for the web-based delivery of ABRs information and partnered products. This is to be enhanced and expanded, with published and new volumes of the *Flora* and *Fungi* being progressively made available. A search facility will be developed to allow easy retrieval of text and other information. Over the next 6–12 months, users should begin to see significant changes to the ABIF site at <http://www.anbg.gov.au/abrs/abif.htm> as work progresses.

Committee changes to improve efficiency and expand perspectives

The resources of the ABRs Advisory Committee are to be extended to encompass a greater range of sectoral contributions, in addition to its broadly representative taxonomic expertise. From December, the Committee will include experts from a range of taxonomic disciplines as well as representatives from the conservation movement, land-care, industry and community education. This is intended to bring a wider perspective to the Committee's work, with renewed focus on the practical application of taxonomic knowledge to environmental issues. The expanded Committee will take on a number of the activities of the former ABRs Editorial Committee, which has now been discontinued. Through its Participatory Program, ABRs will continue to support basic taxonomic research, as well as directed studies into groups or geographic areas that the Advisory Committee believes warrant particular attention.

Structural rearrangements to reflect the diversity of ABRs activities

ABRS has been reorganised into a number of discrete scientific sub-programs that better reflect the diversity of activities and the greater emphasis

that will now be given to lesser known elements of the biota. This change is consistent with recent recommendations of the Biological Diversity Advisory Committee (BDAC) and *National Strategy for the Conservation of Australia's Biological Diversity*, both of which urge that greater attention be paid to those taxonomic groups for which our knowledge is most limited. With static resourcing, this prioritisation would result in a slowing of ABRs outputs on vascular plants and a commensurate increase in activity in other groups. As part of its new business plan, however, ABRs will seek partnership opportunities and linkages with environment and other government programs to extend its resources and accelerate its activities.

The internal reorganisation means that the first point of contact for ABRs should now be through either the Director or the appropriate sub-program leader (see below), depending on the area of specific interest:

Director (Acting)	Dr Geoff Dyne	
	gdyne@ea.gov.au	(02) 62509442
Algae	Dr Tony Orchard	
	tony.orchard@ea.gov.au	(02) 62509443
Bryophytes	Dr Patrick McCarthy	
	patrick.mccarthy@ea.gov.au	(02) 62509447
Fungi	Dr Cheryl Grgurinovic	
	cheryl.grgurinovic@ea.gov.au	(02) 62509446
Lichens	Dr Patrick McCarthy	
	patrick.mccarthy@ea.gov.au	(02) 62509447
Protists	Dr Keith Houston	
	keith.houston@ea.gov.au	(02) 62509436
Vascular Plants	Dr Tony Orchard	
	tony.orchard@ea.gov.au	(02) 62509443

Queries regarding ABIF (flora) developments should be directed to Ms Helen Thompson:
helen.thompson@ea.gov.au; (02) 62509445.

Feedback from clients will assist ABRs to refine its service delivery

Many of these changes are intended to improve the efficiency of ABRs, expand the delivery options for its products and extend their value and relevance to a greater range of clients. After the current transitional period, users of ABRs' services will be encouraged to provide feedback on how successful we have been in meeting these objectives and to make practical suggestions about other possible enhancements.

Save Our ABRS! A CALL TO ARMS

A united effort is required from biologists and users of our products if the Australian Biological Resources Study (ABRS) is to be allowed continue and deliver its objectives effectively. A scan of the ASBS Newsletter - where ABRS reports are published regularly - shows that, since 1987, there have been three major reviews leading to reorganisation, not to mention some 20 other significant changes in structure, name and personnel. Further, since 1981, ABRS has been located at four sites, none of which has been entirely satisfactory for its operations. It has undergone several name changes (and its department even more). Yet throughout, its primary objectives - to find out what biological organisms live in Australia and its territories, where and how they occur, and to disseminate that knowledge - have remained constant [see <http://www.anbg.gov.au/abrs/genabrs/promo.htm>].

The latest change has again reduced staff and funding, disbanded the editorial committees, and seriously rocked the internal unity. The keystone position of Executive Editor has gone. Each time there is a review, a restructure, we are told that this is necessary to improve efficiency, that the stage is now set to move forward more productively. Hollow words!! I am unaware of any such change that has delivered to this promise.

Following a five-year 'trial', ABRS was formally established in 1978. It has clear objectives, and knows how to achieve them. Through its grants program, its publications, and its participation on the national and international stage, it built a first-class reputation. The Flora is regarded as a standard that other countries might aspire to (e.g. R.S.Cowan, *Taxon* 33: 147, 1984). Yet through unnecessary managerial meddling, and complacency on the part of the Australian biological community - you and me - we are in danger of losing it. Perhaps it was because of its success that it became subject to

abuse by those who sought to further their own ends.

It is all too easy to take ABRS, the Flora of Australia, the Zoological Catalogue, the Australian Plant Name Index, for granted. But I remember the years before ABRS, when the effort was disjointed and State/Territory-oriented, when there was no APNI, few modern biological works, few funds for research. We must not let ABRS go and have to struggle again through decades of deliberation and lobbying such as led to its establishment. We would enter another dark age and lose the respect of the international community.

ABRS needs our support. It must be encouraged and allowed to achieve its goals, not subjected to continual review and change which is time-wasting and expensive in its implementation, counter-productive in its effect, and demoralising and demoralising for staff.

We should not leave this to the ABRS Advisory Committee, to chance, to 'others', to FASTS (I cannot remember seeing any mention of ABRS, or indeed of systematics, in FASTS reports in the Newsletter). We must all - as individuals, and through the various organisations and societies that we belong to - make our voice heard so that this essential unit can survive and be allowed to operate effectively.

Stand up and be counted!

Alex George
'Four Gables'
18 Barclay rd
Kardinya
W.A. 6163

ABLO REPORT

Bob Chinnock is currently on his way home after just handing over to Rod Seppelt. A report will appear in the next newsletter.

ARTICLES

John Lindley and Australian Botany

John Lindley (1799-1865) is honoured nowadays as the foremost British orchidologist of the 19th century, but his name does not rank with that of Robert Brown or George Bentham as a botanist who made a significant contribution to 19th century Australian botany. However, he does deserve a place as third behind that of the two botanists mentioned above.

William T. Stearn, writing in the 1999 Bicentenary Celebration Volume on the life of John Lindley, stated that 'Lindley's unexpected interest in the flora of Australia probably arose from receiving for identification a collection of specimens gathered by Major Thomas Mitchell.'¹ This was in 1837. But Lindley had received correspondence and plants from Ronald Gunn in Tasmania as early as 1832 and had named the orchid *Gunnia australis* in 1834. It was also in 1837 that Lindley received a consignment of plants from James Drummond in Western Australia, and this contact was to lead to Lindley's description of 283 species, including 18 new genera, in his publication, *A sketch of the vegetation of the Swan River Colony*.

In 1973 Stearn described Lindley as 'a man endowed with an extraordinary capacity for work and a restless, aggressive untiring intellect, who attained distinction in all his activities. Lindley was among the most industrious, many-sided and productive of the nineteenth century botanists. As administrator, professor, horticulturalist, taxonomist, editor, journalist and botanical artist he used to the full his time, his abundant energy and his remarkable talents, with lasting beneficial results in many fields of botany and horticulture.'²

Ronald Gunn wrote to W.J. Hooker on 1 July 1833, saying, among other news,

'I have again this season sent a small box of specimens to John Lindley Esq. London, but have not yet received a reply to my communication of last year.'³

Ronald Campbell Gunn (1808-1881) arrived in Hobart Town in Van Diemen's Land with his wife and two children in February 1830. Over the next three years he held the positions of Superintendent of a convict barracks in Hobart, Assistant

Superintendent of Convicts in Launceston, and Police Magistrate in Launceston. In October 1830 he met a young man, Robert W. Lawrence, whose interest in botany was to influence Gunn and have a profound effect on his pursuits for many years to come. Lawrence was already collecting material for Sir William Hooker, and in June 1832 wrote to Hooker to introduce Gunn as his friend and co-collector. Gunn himself wrote to Hooker in August 1832, sending a consignment of plants. It was also at his time that Gunn sent plants to John Lindley.

Gunn's relationship with Lindley was not always a smooth one. A letter to Hooker in 1835 indicates that Gunn had washed his hands of Lindley, and yet a letter to Henry Fielding, English amateur botanist in 1838 makes it clear that Gunn was still sending specimens to Lindley, as well as to Hooker. Gunn's letter of 1835 to Hooker stated:

'I have not yet received a single letter or acknowledgement from Dr Lindley - I have therefore sent him my third and last box of specimens - merely containing duplicates of my former collections to render those already received as complete as possible - As I cannot but feel hurt that years should elapse without his finding time to say "thank you" ... I am not aware of any excuse he can make.'⁴

But another letter to Hooker, this time from Lindley, in November of 1835, offers some explanation:

'The fact is I am in a confounded scrap with Mr Gunn, without really desiring to be so. On the 8th April 1834 I made him up a parcel of a few things, books, etc., which Mr Barnard the agent for New South Wales took charge of and undertook to forward free of expense; and whom, upon receiving the other day a letter from Mr Gunn complaining of not having received it, I went to enquire by what conveyance it had been despatched, I found after some trouble, to my indescribable mortification that it was still lying in the Colonial Office. You cannot conceive how this has

annoyed me, further fact is Mr Gunn is as you know a prime correspondent, and it really looks as if I was the most ungrateful of human beings. I am quite delighted at having an opportunity of getting the parcel off by your assistance.^{7,5}

Only a month later Lindley again wrote to Hooker: 'Could you not give me a set of your last things from Gunn – He has not sent me any of his last plants but he tells me you have numbers from 443 to 630. This is a modest request I have – but then I am a modest man.'⁶

Yet in spite of Lindley's apparent neglect of Gunn, he had named an orchid genus after Gunn in September 1834 (Edwards's *Botanical Register* 20:1699). This was *Gunnia australis*, of which Lindley said, 'We have named this most curious plant after our liberal correspondent, Ronald L. Gunn (sic) Esq. who is now examining the vegetation of Van Diemen's Land with equal skill and assiduity.' This plant is now known as *Sarcochilus australis* (Lindley) H.G. Reichb. Was it the first Australian plant to be named by Lindley? In 1837 Lindley received a consignment of plants from James Drummond in Western Australia, and in 1839 carefully prepared material from Mrs Georgiana Molloy, also a resident of Western Australia. Drummond (1784-1863) arrived in the Swan River Colony in June 1829, accompanied by his wife and six children. He took up a post as honorary Government Naturalist, and for some years he supervised the Botanic Garden, for which he received a salary of £100. Later, when financial support for the Botanic Garden was withdrawn, he transferred to a grant in the Helena Valley and in somewhat straitened circumstances embarked on a career as a botanical collector, collecting seeds and sets of dried plants for sale in Europe. Georgiana Molloy (1805-1843), newly married, left England with her husband Captain John Molloy in October 1829, arriving in the Swan River Colony in March 1830. The couple first settled at Augusta, then in 1839 moved to the Vasse River, sixty miles to the north. Drummond had taken up plant collecting as a means of earning money, but for Georgiana Molloy it was a respite from the hardships of domesticity in a frontier settlement.

Captain James Mangles, a horticulturalist in England, had visited the Swan River in 1831 as a guest of his cousin, Lady Stirling, the Governor's wife. When he returned home he wrote to an

acquaintance in the colony, G.F. Moore, in 1835, asking to be sent seeds and plants. Moore asked James Drummond to fulfil this request. It was John Lindley, to whom Mangles redirected Drummond's first collection in 1837, who approached George Bentham about dividing Drummond's plants into sets, there being many duplicates in the consignment. The sets were purchased by several botanists, enthusiastic about the many new species, and Lindley would have kept a set for himself.

Lindley was particularly interested in Drummond's plants because at this time he was busy at work on an account of the plants of the Swan River Colony. There existed a work by the Austrian botanist Stephan Ladislaus Endlicher (1804-1849), *Enumeratio Plantarum quas ... ad Fluvium Cygnorum ... collegit Carolus Liber Baro de Hügel* (May 1837) listing plants collected in the Swan River Colony by Karl A.A. Hügel. When Lindley received Drummond's plants from Mangles, he was delighted to find among his specimens a number of species not recorded by Endlicher. In 1839 Lindley also received many new specimens from Georgiana Molloy, via James Mangles, ones not represented in Drummond's collections. Lindley's *Sketch of the Vegetation of the Swan River Colony*, published November 1839 – January 1840, as an appendix to Edwards's *Botanical Register* (Swan R. App.), was based chiefly on Drummond's collections, with reference also to plants collected by Captain James Mangles, and some grown in the nursery of his brother Robert Mangles. These three were acknowledged by Lindley in his *Sketch*, but no reference was made to studies he had made on the material sent by Georgiana Molloy. While willing to make use of a female correspondent, Lindley was a prominent figure in his day for wanting to modernize and defeminize botany, making a distinction between polite botany – what he called 'amusement for ladies' – and botanical science – what he called 'an occupation for the serious thoughts of man.'

However, Lindley did write to Mangles to express his appreciation of Molloy's qualities:

'Your friend, Mrs Molloy, is really the most charming personage in South Australia (sic), and you the most fortunate man to have such a correspondent. That many of her plants are beautiful you can see for yourself. I am delighted to add, many of the best are quite new.'⁷

Among the orchid specimens in the Lindley Collection at Kew are several collected by Molloy, and also by Drummond, named and described by Lindley. These include *Diuris corymbosa* Lindley, 'Black sandy soil, dryest places. Vasse. Mrs Molloy', and *Eriochilus dilatatus* Lindley, 'Drummond. Swan River.'

John Lindley also worked on Allan Cunningham's Australian plants before he undertook the task of dealing with Thomas Mitchell's collections in 1837. Cunningham (1791-1839) arrived in New South Wales on 20 December 1816, sent to the colony to collect plants for Kew. He first collected while accompanying John Oxley in 1817 in the country west of the Blue Mountains, but between December 1817 and April 1822 he went with Lieutenant Phillip Parker King on five voyages undertaken to survey various parts of the Australian coastline. As ship's botanist he collected assiduously from numerous localities and many of his collections subsequently became type material. From 1823 Cunningham made several journeys west, north and south from Sydney, finding many new species and making useful contributions in terms of exploration.

Cunningham left Sydney on 25 February 1831 to return to England, arriving in mid July. He was to stay until 30 October 1836 when he returned to Sydney to take up the post of Colonial Botanist. While in England he took up residence at Strand-on-the-Green, on the north bank of the Thames, not far from the Royal Botanic Garden at Kew. Cunningham's friend and executor, Robert Heward, recorded that botanists and naturalists used to visit Cunningham at his cottage where he discussed botanical matters with them and often made them gifts of specimens from his collections. Lindley was one such botanist. In November 1834 Lindley published several descriptions of Cunningham plants in Edwards's *Botanical Register*, one example being the following:

Cheiranthra linearis Lindley, Author: A. Cunningham ex J. Lindley. Type: Found in dry barren tracts of country to the north of Bathurst, New South Wales, where it was observed in flower and young fruit in November 1822. 'By means of a drawing from the living plant, and fine dried specimens with which Mr Cunningham has supplied us, we are enabled to draw up the following character of this most interesting genus.'⁸

In 1836, when Cunningham had decided to return to Australia, he wrote to William Hooker to say he had broken up his herbarium, 'having given the better portion to MM. De Candolle, Martius, Endlicher, Schauer (Breslau), Fischer, Lindley, Don, Bentham and some few much esteemed friends, lovers of Botany.'⁹ It is clear from an examination of Lindley's prestigious work, *The Genera and Species of Orchidaceous Plants* (1830-1840) that he had received many orchid specimens from Cunningham prior to the latter's death in 1839. The following is just one example among many (March 1840):

Caladenia clavigera Lindley. Author: A. Cunningham ex J. Lindley. Ref: *Gen. & Sp. Orch.* 422. Cunningham's type locality was the Vale of Clwydd near the present town of Lithgow, October 1825. (Ronald Gunn is also mentioned here as supplying specimens of this plant from Tasmania.)

Lindley was also to be a recipient of more Cunningham plants when Robert Heward distributed Cunningham's plants after the latter's death.

Although not his first encounter with the Australian flora, Lindley's work on Thomas Mitchell's plants in 1837 was a more substantial undertaking, comparable with his *Sketch of the vegetation of the Swan River Colony*. For new species collected by Mitchell (or his assistants) Lindley provided names and concise Latin diagnoses published as footnotes at appropriate places in Mitchell's account of his travels, 'Three Expeditions into the Interior of Eastern Australia, with Descriptions of the recently explored Region of Australia felix and the present Colony of New South Wales' (1838; 2nd ed. 1839). Lindley's notes were reprinted in *Annales des Sciences naturelles* 15:56-64 (1841).

Thomas Livingstone Mitchell (1792-1855) arrived in Sydney in 1827 as assistant surveyor-general, becoming surveyor-general in 1828. His interest in exploration developed early, his first expedition to northern New South Wales being undertaken from November 1831 to February 1832. On his second expedition (March 1835-Sept 1835) he had taken Richard Cunningham (Allan's brother) as collector, but Richard was tragically killed by Aborigines. The third expedition (March 1836-Nov. 1836) went south-west, down into Victoria, where he discovered a fine tract of land he named 'Australia Felix.' Mitchell left Sydney on 19 March 1837

REVIEWS

Conference Review

Palaeobotanists meet in Qinhuangdao, P.R. China

Every 4 years members of the International organisation of Palaeobotany meet for a conference. Recent past meetings have been held in Santa Barbara California (1996), Paris (1992), and Melbourne (1988). This year IOP met for IOPC-VI over July 31-August 3, in the coastal city of Qinhuangdao, in Hebei province, in the People's Republic of China. The conference was organised by the Palaeobotanical Committee of the Palaeontological Society of China and the Palaeobotanical Committee of the Botanical Society of China. Staff and students from several Chinese universities and institutes played significant roles in the running of the IOPC-VI, and the general consensus of the foreign delegates was that they carried off a mammoth task with skill and diplomacy, delivering a first rate conference. A surprise to some participants was the modernity of Beijing, which today is a vista of soaring glass and concrete office towers and apartment blocks, as well as new elevated expressways (all tollways), and a strong capitalist ethos expressed in advertising and the way business is transacted. The conference itself received abundant publicity in the Chinese electronic media, with local TV camera crews filming many events and even some sessions of talks during the conference. It was a nice change to be feted as 'international experts' by both local officials and the media (even if the banner above the hotel entrance did read 'experts on the study of the ruins of trees and the origin of life').

Over 200 foreign and Chinese palaeobotanists participated in the conference, with delegates from every continent, even Antarctica, if you count long-term scientific expeditioners such as Steve McLoughlin (Univ. of Melbourne) or Tom and Eddie Taylor (Univ. of Kansas). Russian and other former eastern bloc country palaeobotanists were well represented, as were Australian (D. Greenwood, VUT; S. McLoughlin & N. Nagalingum, Univ. Melbourne; J. Rigby, QUT), European, UK, Indian, and US palaeobotany. South Africa, Argentina, Canada, Thailand, and Mexico were each represented by participants from a single institution.

The presentations at the conference covered a broad range of themes, including specialised symposia. Owing to the large number of registered participants and presentations, up to 4 concurrent sessions were timetabled on each of 3 days over a 4 day period, with a tour to see the local part of the Great Wall of China (and a tour of a 'Special Economic Zone') scheduled for the 3rd day. A small but vocal group of postgraduate students from Australia (Univ. Melbourne), Canada, China, Germany, South Africa and elsewhere made presentations. A brief snapshot of the themes covered is provided by this partial list of topics (students*):

- The effects of a CO₂-rich atmosphere on plants: its relevance to palaeobotany – D. Beerling
- Considerations of whole plant biology and evolution in teaching palaeobotany – D. Dilcher
- Form, functions and functioning in sporangia of early land plants – D. Edwards
- Leaf margin analysis: the Australian perspective – D. Greenwood & D. Christophel
- A new species of stem from the Triassic of Antarctica – E. Taylor *et al.*
- Significance of molecular phylogenetic analyses for paleobotanical investigations on the origin of angiosperms – H. Falcon-Lang *et al.*
- Significance of molecular phylogenetic analyses for paleobotanical investigations on the origin of angiosperms – J. Doyle
- Mid-Tertiary floristic exchange within extratropical Russia – M. Akhmetiev
- Tertiary angiosperm woods from the west coasts of Southern Africa – M. Bamford
- The ecology of Cainozoic ferns – M. Collinson
- Historical biogeography of the family Anacardiaceae – M. Martínez-Millán* & S. Cevallos-Ferriz
- Patterns of pteridophyte evolution in the Cretaceous of southern Gondwana – N. Nagalingum* *et al.*
- Schizaceae: a phylogenetic approach – N. Wilkström *et al.*
- A samaroid fruit of Dipterocarpaceae from the Deccan Intertrappean Beds of India – R. Dahegaonkar *et al.*

- Fossil aquatic plants from the Middle Eocene
Princeton Chert: reconstructing Lythraceae – S. Little* & R. Stockey
- Reproductive biology of *Archaeofructus* from the
Lower Yixian Formation of Northeast China –
Sun Ge *et al.*
- Implications of Cretaceous (Turonian) angiosperm
flowers and inflorescences from North America
– W. Crepet
- Early Cretaceous diversity of Gnetales: macro- and
mesofossil evidence from China, Brazil and
Portugal – Wu Shunqing *et al.*

A theme running through a number of talks in several symposia was the need for palaeobotanists to broaden their research focus from systematic and comparative morphological research, to encompass topics relevant to a wider audience. Dialog with other stake holders, such as neobotanists and ecologists, as well as earth scientists was promoted as essential to the continuing relevance of palaeobotany. Communication of the relevance of our research to the wider community (who through their taxes pay for the research) was also discussed. Two examples of this included (but were not limited to): 1) reconstruction of past ecosystems as a means of testing ecological theory, and 2) reconstruction of past climates, as a means of testing or 'ground truthing' computer generated models of climate (e.g. greenhouse / climate change research). Their argument was that palaeobotany had remained a dynamic vibrant discipline precisely because it was inherently multidisciplinary in nature, and thus was well placed to address questions of interest to a wide audience. Other speakers addressed the emerging marriage of molecular and morphological phylogenetic datasets, and how fossil data was contributing to this (but the phylocode was quietly mentioned only in passing).

On a personal note, I presented 2 talks, with one talk (David Christophel as senior author) as part of a symposium organised by Steve Manchester (Florida Museum of Natural History) and Zlatko Kvacek (Czech Republic) on intercontinental

exchanges of plant taxa, documenting the Australian Tertiary record of taxa shared with neighbouring landmasses. The symposium including speakers from the US, China, Europe and Russia. My talk focused on key Australian groups, such as Casuarinaceae (e.g. *Gymnostoma* speciose in Malesia, 1 spp. in NE Australia), Lauraceae, Proteaceae (e.g. Heliciae), and Ebenaceae, as well as biogeographical enigmas that have come to light through the research of Bob Hill and his group (e.g. early Tertiary *Ginkgo* from Tasmania).

The election of the new IOP executive occurred during the IOPC-VI, with Else Marie Friis (Sweden) elected President of IOP, and Gar Rothwell (USA) elected secretary. The long standing secretary of IOP, Mike Boulter (UK), stood down after over 20 years of service, and received warm praise from the outgoing and incoming executive, as well as a standing ovation at an official banquet. Several 'members at large' were also elected to the IOP executive, including Andrew Drinnan (Univ. Melbourne). The normal practice at these meetings is to select the place of the next IOP meeting in 4 years time, however in break from tradition further nominations were called for, with the sole bidder asked to resubmit a detailed bid for consideration by the executive.

From a personal perspective the conference was a great success. I feel that Australian palaeobotany was shown by several presentations (Christophel, Greenwood, McLoughlin, Nagalingum, and Rigby) to be thriving, and equally importantly, producing high quality botanical science. Any neobotanists interested in joining IOP should contact Andrew Drinnan.

David Greenwood

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Book review

Hakeas of Western Australia by Jennifer Young, privately published

There are three volumes with the subtitles

Botanical District of Avon: The Wheatbelt, published October 1997, pp. 132; \$16.50 (referred to below as '1')
Botanical Districts of Irwin and Darling: The Northern Sandplains and The South-west Forest, published April 2000, pp. 160; \$22.00 (referred to below as '2')

Botanical Districts of Roe and Eyre: The Mallee and The Esperance Plains, published June 2000, pp. 164; \$27.50 (referred to below as '3')

These three softcover books are intended to assist the identification of all species of *Hakea* in the South-West of Western Australia, and to provide advice on their propagation, especially for people involved in Landcare projects. In general they succeed very well in those aims. The three cover 44, 60 and 64 species respectively. There are no keys, but there is a colour photograph of most species, a page of line drawings with a fruiting/flowering branchlet and seeds in plan and horizontal view, and a page of text that covers distribution, flowering times, habitat, general morphology, uses and derivation of the specific epithet. There is a table that also indicates flowering times, as well as rainfall, soil, height and uses. Further tables list the species that occur in each shire covered by the volume, a useful feature for those involved in replanting the local flora. The photos, by the author, are mostly close-ups of flowers and leaves. Most are very good but some that are out-of-focus or under/overexposed, though adequate for their purpose. Several are upside-down or on their side, e.g. *laurina*, pink *lissocarpa*, *preissii* (1), *smilacifolia* (2), *prostrata* (3). The line drawings, by the author, are clear and well reproduced. Several species that had manuscript names when the books were in preparation have now been formally published (Barker, Haegi & Barker, *Flora of Australia* 17B, 1999). *Hakea coriacea* is treated as a species rather than in synonymy under *H. francisiana* (Barker, Haegi & Barker, *op. cit.* 162).

Information on propagation is fairly basic, but hakeas are among the easier native plants to grow. Seed is usually available on the plants (if commonly uncomfortable to collect among the prickly foliage!), and usually germinates readily. The presence of a lignotuber is noted, a useful feature in managing cultivated plants.

A list of important references closes each volume, but the *Flora of Australia* account by Barker, Haegi & Barker (1999) is not listed.

Species with wide distributions are covered in two or three volumes, with the account \pm repeated but

sometimes with different photographs. The descriptions generally are accurate and easy to follow.

Several errors have slipped through in the books. *Hakea subsulcata* does not reach Sandstone, occurring no farther north than the Southern Cross area. *Hakea ceratophylla* does not extend east of the Stirling Range, nor does *H. cucullata* occur east of the Fitzgerald River National Park. *Hakea erecta* and *H. platysperma* occur towards Coolgardie but not as far as Kalgoorlie. *Hakea elliptica* grows to 5 m. *Hakea aculeata* and *H. ruscifolia* have terminal, not axillary flowers. *Hakea victoria* was named by Drummond, not Gilbert. The specific epithet of *Hakea smilacifolia* probably refers to the resemblance of the leaf to *Smilax*, not *Convolvulus*.

Some editing would have improved these books with further corrections such as Gingin (not Gin Gin which is in Queensland, 2: 125, 147), Kondinin (not Kondinen, 1: 27), Darling Range and Stirling Range (neither is plural), 'ovoid in shape', 'dark green in colour' and 'fragrantly scented' (tautologies, all volumes), predominant (not predominant, *H. trifurcata* in all volumes). Robert Brown was not the 'first person to write on the Australian flora' (1: 31). The glossaries and illustrations of parts and shapes would have been better placed together, and the indexes to common and scientific names would have been more user-friendly if combined. These are minor quibbles, however, and do not detract from the overall usefulness of the books. They are very good value.

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Book Review

Plant Systematics. A Phylogenetic Approach

by Walter S. Judd, Christopher Campbell, Elizabeth A. Kellogg and Peter F. Stevens.
Sinauer Associates: Sunderland, Massachusetts, USA, 464 pp. 285 illustrations.
ISBN 0-87893-404-9. \$67.95 US (hardbound text with CD-ROM).

This book is a "must read" for all contemporary, practising plant taxonomists and has already received a glowing review in the U.S. (Cantino 1999b). It brings together a complete overview of plant systematics from a phylogenetic perspective, although the contents are strongly biased towards the North American market. This is to be expected, as the main aim of the book is an introductory text to plant systematics for tertiary students in the U.S. Consequently, most of the illustrations of the main plant groups, the accounts of which make up most of the latter two thirds of the book and the 650 photos of the accompanying CD-ROM, are from those plants most likely to be familiar to that market. A useful feature of the photos is that they can be accessed in three ways, via order names (arranged in the phylogenetic sequence of the book), family names (arranged alphabetically) or species names (arranged alphabetically by genus).

The foreword by Michael Donoghue, formerly of Harvard University, sets the tone well for the book. The dramatic transformation of plant systematics over the last two decades following unprecedented advances in the field of phylogenetic relationships, particularly in relation to molecular data, has been the catalyst in producing this book. The project that had its origins in the late 1970s, when all authors were at Harvard, three as graduate students.

This is the first textbook on plant systematics organised to reflect the most recent findings from a phylogenetic perspective. Until now basic texts have still been organised along traditional lines. An accompanying CD-Rom lists the traditional classifications of Cronquist, Thorne and the Angiosperm Phylogeny Working Group for comparison with the classification that the authors use.

In terms of the current biodiversity crisis and the surge of discovery of new plant species, particularly in tropical areas like Queensland, this book is very timely, and it presents plant taxonomy as an exciting activity. As Donoghue points out "this is a wonderful and especially important time to be a plant systematist".

Following a forward and a preface the book is arranged into six main chapters before the latter

section of the text (Chapters 7 and 8), which deals in detail with each of the phylogenetic groups of the classification system used by the authors.

Contents

Chapter 1. The Science of Plant Systematics

This chapter sets the tone by discussing what constitutes a plant, and the practice and importance of systematics in the present-day world.

Chapter 2. Methods and Principles of Biological Systematics

This chapter looks at systematics solely from the phylogenetic viewpoint. The reader is taken step by step through the theoretical details of phylogeny and cladistic principles used in determining evolutionary history. Technical terms appear in bold print when used for the first time, a useful feature when looking back through the text for these particular terms. Basic cladistic concepts are well explained, as well as a section on the construction of a classification from a cladogram, and a good comparison of phylogenetic classifications to those derived from phenetics and evolutionary methods where paraphyly is accepted.

Chapter 3. Classification and Systems in Flowering Plants: The Historical Background

This chapter examines some of the main players in the development of plant classifications and how their philosophies, or lack of them, have influenced classifications. The authors emphasise the importance of phylogeny in classification and show how "nonphylogenetic ideas have become incorporated into twentieth century classifications." Classifications and systems discussed date from Caesalpino to the present day and include de Jussieu, Giseke, Tournefort, Linnaeus, Adanson, Lamarck, de Candolle, Bentham, Gray, Bessey, Engler, Gilmour, Dahlgren, Cronquist, Thorne, and Takhtajan. The influence of the theories of Charles Darwin (Darwin 1859), while providing a framework by which taxonomic groups evolved, did not provide a method of detecting relationships. In this context a recent paper on Darwin's views on classification (Padian 1999) indicates that while dual criteria of genealogy and similarity have been attributed to Darwin by Mayr (1994), it appears evident that

"Darwin's only criterion for classification was genealogy."

Chapter 4. Taxonomic Evidence: Structural and Biochemical Characters

All non-molecular characters that are utilised in contemporary angiosperm taxonomic studies are briefly reviewed in this chapter. They include characters from morphology (vegetative and reproductive), anatomy (many sources), embryology, chromosomes, palynology, secondary plant compounds and proteins. In addition is an informative section on pollination biology. All terms are given in bold type for easy reference. The number of terms are kept to a minimum, far less than those found in the glossary of a modern flora such as the Flora of Australia, but they are precisely defined and unambiguous in most cases, and supported by clear illustrations.

Chapter 5. Molecular Systematics

The past two decades has seen an explosion of molecular techniques extracting data from DNA and RNA and applying these to systematics. This chapter gives a good summary of the many techniques known. Subheadings in this chapter include Generating Molecular Data, Types of Molecular Data, Analysis of Molecular Data and Molecular Characters. A lot of information is given under each subheading and overall the chapter provides a useful introduction to this specialised field of systematic research, which is currently receiving much attention and funding in taxonomy. Indeed it is considered by some to have been given too much emphasis in recent times, to the detrimental exclusion of other areas of systematics (Lammers, 1999).

Chapter 6. The Evolution of Plant Systematic Diversity

This chapter looks at various aspects of evolutionary theory and the effect the latter has had on systematics, particularly variations in plant populations, speciation and species concepts. This ranges from a specialised box showing Darwin's logic in developing his ideas on natural selection to the more current genetic aspects of evolution. Much work was done in this field since the 1940's and before the cladistic era by many workers engaged in the "New Systematics." Well known American classics in the field are Stebbins (1951), Grant (1978), Grant (1981), all referred to in the text, as well as the British equivalents - Huxley (1940), Davis & Heywood (1961), Heslop-Harrison (1967) and Briggs & Walters (1969) - as well more contemporary references.

Under the heading of **Speciation** the topics of **Reproductive Isolating Mechanisms, Hybridization and Introgression** (including a section on hybridization and phylogeny reconstruction), **Polyploidy and Plant Breeding Systems** are lucidly covered in some depth. A section on Species Concepts is of particular relevance to the modern-day plant taxonomist, as theoretical aspects of systematics become more relevant to the "science" of systematics of today with the provision of cladistic data becoming more common in systematic journals. Seven species concepts are discussed, with four based on phylogenetic principles. The phylogenetic species concept as previously discussed (Nixon & Wheeler 1990, Snow 1997) is considered ambiguous and is replaced by three more specific concepts depending on the criterion used - the autapomorphic species concept, the diagnosability species concept and the genealogical species concept. Only the second is given some support by the authors. It is dependent on the fixation of a character state, although the definite application of when a character can be said to be fixed can often be problematical. It should be noted that this concept does not require phylogenetic analysis for application (Nixon and Wheeler 1990), whereas the autapomorphic species concept does. Use of the latter species concept is often difficult, as terminal units in a cladogram may often lack autapomorphies and only appear as a result of homoplasy. The term metaspecies is applied to these terminal unresolved taxa (Donoghue 1985) and is not discussed by the authors. The genealogical species concept is not supported by the authors due to what they see as a fundamental flaw based on genetic reasons. A notable omission of another phylogenetic species concept is the composite species concept (Kornet 1993) with the introduction of the term internodon.

The chapter concludes with a section on species that are very difficult to distinguish, such as microspecies and agamospecies, although it does not recommend how to treat them phylogenetically, and gives some guidelines for the basic recognition of species.

Chapters 7 and 8

The remainder of the book (about two thirds) deals with the major groups of plants arranged within the major clades recognized by the authors. (Chapter 7 Tracheophytes, excluding Angiosperms and Chapter 8 Angiosperms).

Chapter 7. Phylogenetic Relationships of Major Groups of Tracheophytes, Excluding Angiosperms

This chapter breaks up the non-Angiosperm Tracheophytes into the four clades of free-sporing tracheophytes (currently called pteridophytes) - lycopodiophytes, psilophytes, equisetophytes and leptosporangiate ferns - and four clades of non-angiosperm seed plants (currently known as gymnosperms) - cycads, ginkgos, conifers and gnetophytes.

Within each of the phylogenetic groups of Chapter 7 and Chapter 8 traditional botanical families are treated, where these have been shown to constitute a phylogenetic lineage by cladistic means, with the description of each showing synapomorphies in **boldface** and other useful identifying characters in *italic print*. Furthermore, family discussion includes information about characters supporting the group's monophyly, a short overview of phylogenetic relationships within the family, information on pollen biology and seed dispersal and further notes of interest. Each family treatment also has a list of further references.

Chapter 8. Phylogenetic Relationships of Angiosperms

This chapter divides the Angiosperm Tracheophytes into the well supported clades, the tricolpate (eudicots) and monocots, and two groups of less well defined clades the Magnoliales, the Laurales and the Illiciales (collectively known as the Magnoliid group), and the Piperales + Aristolochiales and Nymphaeales (known as the Paleoherb group, which also include the Monocots). As such the old Dicots are not well defined, as they form a paraphyletic complex and the traditional morphological features by which they are known "evolved earlier in the phylogenetic history of the tracheophytes."

The tricolpate clade is divided to 6 small clades (the Ranunculales and the Proteales comprising the basal tricolpates, the Caryophyllanae (Caryophyllales and Polygonales), Saxifragales and Santalales and two large ones the Rosid clade and the Asterid clade (the classical Sympetalae).

Although the monocot clade is a well defined clade, no cladogram is presented for the lineages within the Monocot clade in the text, although they can be found in the references given (Stevenson and Laconte 1995). Separate clades are, however, presented for the Poaceae and the Zingiberales.

The general topology of the angiosperm cladograms producing the clades described above is remarkably similar for characters derived from a morphological and three molecular datasets.

Altogether 130 families are given detailed treatment, with an additional 95 families given brief mention. This North American sample is a good cross section of the 462 families recognized by the Angiosperm Phylogeny Group, which in turn can be compared with the family numbers given in texts of recent classifications Thorne (1992) with 440, Cronquist (1988) with 387, Dahlgren (1983) with 462 and Takhtajan (1980) with 589. A useful table of the families of angiosperms treated in the book is given, with the page numbers shown where the family treatment occurs in the text. Throughout the book the text is enhanced by beautiful and clear line drawings from the Generic Flora of the Southeastern United States (Wood *et al.* 1958).

From the perspective of an Australian reader this introductory text can be used successfully by tertiary students in this country. Of the 117 families that receive full coverage in the text 111 occur in Australia. There are 53 families from the Flora of Australia Cronquist (1981) classification that are not mentioned in the book at all. Using the Cronquist system as a basis for comparison, about 51% of North American Angiosperm families are fully described in the text and about 30% of world families. It would be nice to think that future editions may be enlarged to include the remaining families of North America and finally of the world using a phylogenetic approach.

Appendix 1 Botanical Nomenclature

This is a good precis of the current practices and procedures concerning the naming of plants under the International Code of Botanical Nomenclature. It contains a useful table of commonly used specific epithets, with the English equivalents appended and a good list to consult when deciding the possible names to use when describing new species. There are also small sections on Cultivated Plants and Hybrid Names.

Appendix 2. Specimen Preparation and Identification

This deals with the bread and butter issues of plant systematics. Under this heading are considered the methods of collecting and identifying plants, herbaria and botanic gardens, and the mounting and preparation of herbarium specimens. Under plant identification examples of indented, dichotomous and multi-access keys are shown for a group of five imaginary plants. The main North American floras

are listed separately in the references and there is a table of some important botanical journals, where monographs and taxonomic journals are published. The bias to U.S. journals is shown in this table by 19 of the 31 journals listed being published in the U.S.

Each chapter in the book has its own references under the heading **Literature Cited and Suggested Readings**. Of the topics covered in the chapter those recommended by the authors to be followed up for further information are indicated with an asterisk.

An excellent feature of the book is the use of boxes to highlight some of the concepts and theories discussed in the text, most of them based on original studies. This is presumably aimed at the graduate student who is required to study these aspects in greater depth than the general reader.

One of the most useful chapters of the book (Chapter 2: Principles of Biological Systematics) and can be downloaded from the internet at <http://www.sinauer.com/Titles/frjudd.htm> and read in an Adobe Acrobat Reader. In addition the first part of Chapter 8: Phylogenetic Relationships of Angiosperms, which includes the monosulcates (Monocots and other "paleoherbs" and the "magnoliids"), can be similarly accessed.

Several issues related to phylogenetically based taxonomy I feel should have received more discussion by the authors, as they would have given students a greater insight of different controversies that have arisen during the generation of cladistic theory, between cladists, evolutionary systematists and pheneticists. Possibly as the authors of this book are cladists, and as cladistic methods are becoming accepted by taxonomists as the scientific way to undertake systematics, a textbook may not be the place to present other viewpoints too strongly. However I feel a better product would have been achieved by looking at some of these controversies in greater detail. Some of these issues are somewhat dated and have been discussed previously in an easily comprehensible style (Linder 1988), but others date from more recent times. Also some topics are more to do with basic cladistics and may be considered to be beyond the scope of the book. Some may also be considered too complex to be discussed in a text written for undergraduates, but I feel they could be covered in an enlarged Chapter 2 of a future edition by the use of boxes, as has been done for some other specialised topics.

1. Recognition of paraphyletic taxa

Although the cladistic purists claim that paraphyletic taxa are taboo (refs Humphries & Chappill 1988, van Welzen 1997, 1998, Freudenstein 1998), others (Mayr 1974, Cronquist 1987, Brummitt 1996, Paton 1997, Sosef 1997, Brummitt & Sosef 1998) feel equally strongly that, although well supported monophyletic clades should receive recognition in a classification, there are often cases where clades in a paraphyletic residue have only weak support and it is difficult to justify their recognition. This is an extremely important issue and impinges on how taxonomists of the present and the future are to present their classification to the users of their systems. Pure cladists place greater emphasis on the phylogenetic history of their groups measured by branching patterns on a cladogram, regardless of their recognition on morphological grounds, although Judd *et al.* do advise that only clades that have a morphological basis should be named. Perhaps some sort of middle ground, as aired by the views of Ashlock (1974), Mayr (1974), Kinman (1994) and Stuessy (1997), will produce a better outcome. Knox (1998) foresees a future for systematics where methods for analysing patterns of modification will complement current cladistic methods for analysing patterns of descent. However the algorithms to produce this more desirable phyletic classification, have yet to be forthcoming, although Stuessy (1997) has hinted of possible methods. However in a review of earlier views of Stuessy (1990) on phyletic classification, Morrison (1993) makes the comment on the necessary use of plesiomorphic characters that such a classification would require.

"Unfortunately, determining precisely when these plesiomorphies are useful does not appear to be able to be made explicit, thus leaving a very large subjective component in an otherwise laudable attempt to be objective."

A recent paper by Cantino (1999a) has arrived at a compromise between "phylogenetic and pragmatic imperatives" in his classification of *Caryopteris* and related taxa.

As to exactly how we should be doing our taxonomy at present, in the light of the theoretical explosion on phylogenetic theory, has been discussed recently by Peter Stevens, one of the co-authors of this book (Stevens 1990, 1995), although he writes strongly from the viewpoint of a strict cladist. Contrasting with this are other views (Nooteboom 1988, Bramwell 1989) that taxonomists should be spending their time working on basic flora accounts at a time when levels of biodiversity

are being depleted so drastically (Prance 1998, Raven 1992, Soulé 1990), instead of getting sidetracked into phylogeny studies. Yet another view (Grimes 1997) is that floras (accounts of plants within a given political or geographic range) should wait for the completion of monographs (systematic revisions of (monophyletic) groups of plants throughout the group's range). In this way the quality of the data that is entered into flora accounts can be as scientific and accurate as possible, rather than just a rewrite of other accounts of variable quality.

2. Phylogenetic Nomenclature

There is a current view (de Queiroz 1990, de Queiroz & Gauthier 1992, de Queiroz 1996, Cantino 1998, 2000, Cantino *et al.* 1997, 1999b) that a whole new system on nomenclature is required in addition to or to replace the Linnean system that has been in use for over two hundred years, if future systems of classification are to be completely phylogenetically based. The basic omission of this topic in a book concerned with phylogenetic systematics, other than a passing reference to it, does seem somewhat strange and has been referred to in another review (Cantino 1999b). Some authors (Brummitt 1996a, Brummitt 1997, Brummitt & Sosef 1998) feel that the basic philosophical difference between a mutually exclusive Linnean hierarchy and an interesting phylogenetic hierarchy does not allow for the use of the Linnean system in phylogenetic classifications, although this nomenclature has been used in most cladistic texts of recent times. These authors also believe that classifications using Linnean nomenclature should include paraphyletic groups (see above) and suggest that the phylogeny, as represented by accompanying cladograms, be termed "cladonomy" (Brummitt 1997), as opposed to the classification of taxonomy. Other terminology for these two hierarchical models in systematics is monophyletic systematisation versus Linnean classification (Knox 1998). An example of the application of both Linnean and phylogenetic nomenclature to the same groups of plants is that of Cantino *et al.* (1999a), where two classifications are presented for *Caryopteris* and related taxa. One shows traditional nomenclature and the other the conventions of phylogenetic nomenclature, using hyphenated uninomials for species. A vigorous debate on the internet dealing with phylogenetic nomenclature has resulted in the publication of a paper (Cantino *et al.* 1999b) in which 13 methods have been proposed for naming species using phylogenetic nomenclature. Some of them will presumably be incorporated into a draft Phylocode. An interesting compilation of some current trends in relation to biological nomenclature is the

publication of the proceedings of a mini-symposium dealing with this subject on the internet (Reveal 1996), when aspects of traditional nomenclature, integrated biological nomenclature and phylogenetic nomenclature were discussed by various authors.

3. Transformed (pattern) cladism

Evolution essentially involves a combination of pattern and process. It is possible to study each separately, or together. The pattern that is produced in a cladistic analysis by means of a parsimony based search for hierarchic arrangements of terminal units, is independent of the process by which the pattern is brought about. There are cladists (Nelson & Platnick 1981, references in Hull 1988) that are interested only in pattern, and not process, and they have been termed pattern or transformed cladists. They insist that cladistically based classification should be as theory free as possible. However phylogenetic analysis, as conceived by Hennig (1966) includes the hierarchic descent relationships among species, and so considers process as well as pattern.

4. Ancestor-descendant relations

Cladistic theory does not allow any taxon to be an ancestor of another one, but that all are derived from hypothetical ancestors. Even fossils, if enough characters are present to be coded, are to be treated, for cladistic purposes, as extant taxa. When these ideas were first published they caused a great disruption to traditional evolutionary theory at the time (see details in Hull 1988), particularly among established evolutionary zoologists at the American Museum of Natural History and the Natural History Museum, London. This issue has also been strongly contested in the papers by Brummitt (1996, 1997, 1998), particularly in his explanation as to how he viewed the derivation of a new genus *Ptychobium* from a large extant genus *Tephrosia*. The crux of the issue is explained by examining Fig 14 in Hennig (1966), entitled "The species category in the time dimension". All speciation is regarded as a dichotomy with the immediate extinction of the ancestral lineage, whether there appear to be one (as in species C) or two descendant lineages (species D and E). The fact that species A and B are identical has no bearing on the fact that they are theoretically considered different by Hennig. Following cladistic theory, however, A becomes extinct when C diverges from it. In the case of the *Tephrosia* and *Ptychobium*, it is no longer possible to have a genus *Tephrosia* once *Ptychobium* has diverged from it. The insistence that an extant (or ancestral) species cannot be recognised in phylogenetic systematics forms the basis for cladogram topology and appears arbitrary, but is

essential if strict monophyly is the sole principle in systematics (Knox 1998). Other interesting philosophical issues related to ancestor-descendant relations are discussed by Hull (1979).

5. Parsimony

Parsimony is the principle that the cladogram with the fewest character-state changes is the preferred explanation to explain the phylogeny of a group, as it minimizes the number of ad hoc explanations of the data. It is the basis of the most commonly used methods of cladistic analysis for morphological data. The philosophy of parsimony is however not as simple as it may appear and there are views on its controversial nature when applied to the natural world (See references in Minelli (1993).

6. Cladogenesis and anagenesis

The dichotomous branching pattern produced in a cladogram is the primary basis for the interpretation of phylogeny by cladists. Critics of cladistics think this interpretation of phylogeny is too one-sided, with too much emphasis being given to cladogenesis and none to anagenesis, which comprises the other main aspects of evolution. This is stated lucidly by Mayr (1974)

"By claiming that branching is the only historical process of consequence, he [the cladist] denies that other aspects of evolutionary change such as rate of evolution, adaptive radiation, the occupation of new adaptive zones, mosaic evolution, and many other macroevolutionary phenomena are eligible for the term "historical process". For this reason "cladistic classifications concerned only with apomorphic similarity are often drastically unlike those produced by any other method" (Ashlock 1974). Other components that contribute to a phylogeny, apart from the branching pattern in a cladogram, are chronistics and patristics, well depicted in illustrations in Stuessy (1983), with phenetic relationships also included. I feel the interchangeable use of the terms evolutionary tree, phylogeny and cladogram by Judd *et al.* oversimplifies the situation."

7. Taxonomy and evolution of cultivated plants

The first chapter of Charles Darwin's classic *Origin of Species* (Darwin 1859) concerns variation in cultivated plants, with a comment "one of the first points which strikes us, is, that they generally differ much more from each other, than do the individuals of any one species or variety in a state of nature". This greater variability of cultivated plants, compared to wild plants, is of interest as to how taxonomists regard them as evolutionary units and nomenclaturally. Plant

breeders are generally able to introduce morphological variation by a combination of altering ploidy levels and hybridisation (see Darlington 1973 for details and examples), both of which normally fall outside the realm of consideration for cladistic analysis as they produce a pattern of reticulation considered incompatible with the hierarchical patterns of phylogeny reconstruction. However McDade (1995) has demonstrated that hybrids do not disrupt the phylogeny to any great degree. Cultivated plants of plant breeders are normally fixed genetically by the breeder, as wild species are fixed in nature by evolutionary parameters. Nomenclaturally they are controlled by a separate code of nomenclature, in which the term *cultivar* (*cv.*) is attached to the Linnean binomial or common name. Despite the fact that "cultivars" are not amenable to cladistic study, for the reasons given above, cladistic studies have been done on groups that include plants that are commonly cultivated, such as the family Iridaceae, particularly the genus *Gladiolus* (Goldblatt 1996, Goldblatt & Manning 1998).

8. Incorrect homology assessment.

The understanding of homology (Sattler 1984) and its correct assessment in characters is of the utmost importance in cladistic analysis (Stevens 1984). The more homologous characters used in a cladistic analysis is a suggestion of how reliable is a classification produced from such an analysis. Conversely the greater number of homoplasies in a cladogram the less reliable is the resulting classification. Incorrect homology assessment will lead to problems in producing classifications, particularly when morphological characters are used without an insight as to the molecular basis behind the character. An example is the development of unisexual spikelets in different clades of the grass family, where the basis for producing the expression of this character is different among the clades, and the character for unisexual spikelets is thus not homologous across the family (Kellogg 1999).

9. Character Polarity

Before the widespread use of computer software to run cladistic analyses, when polarity was assigned automatically to the character states following the selection of an appropriate outgroup (Donoghue & Cantino 1984), cladistic studies necessitated the designation of character polarity to each character state in a data matrix. For this reason publications on character polarity were more common at that time (Stevens, 1980). However the issue of character polarity is probably underestimated today, with the assumption that selection of the

correct outgroup will solve all matters to do with polarity. The selection of the outgroup in itself is a subjective, intuitive process that requires care. There should be an appropriate number of homologous characters from the ingroup also present in the outgroup, for a comparison between the two to be possible. Care should also be taken in assessing whether the lack of a character state indicates whether the state is "primitive" or a secondary loss (reversal).

10. Infra-specific taxa

Varied opinions on the status of infra-specific taxa, published both before and since the development of phylogenetic theory, have been published, but there is hardly a mention of the issue in Judd *et al.* other than the subspecies being a category within a species that indicates the shutting off of gene flow during speciation. Some workers (Guala on Taxacom 09/11/1999) believe that if a phylogenetic species concept is adhered to strictly there can be no subspecies "because the species is the "minimum diagnosable monophyletic group" and we don't recognize non-monophyletic groups, thus there can be no subspecific ranks. Groups either are species or they aren't. If they aren't then we don't formally recognize them." Snow (1997) believes that "infra specific taxa can be phenetic groupings that reflect genetically-based variation, the patterns of which are non-fixed and non-hierarchical" and used this concept for recognition of subspecies within *Leptochloa*. Other workers do not place any greater importance to the species rank than to infra-specific ranks and appear to select the ranks they use without the application of any phylogenetic species concept. Thiele (1993) has different subspecies of *Banksia integrifolia* represented as separate terminal taxa in one clade, and the only reason precluding the use of the species rank for these entities was the presence of intermediates. Subsequently Thiele (pers.comm.) has stated "all taxa (subspecies, species) are taxa, and there are no essential differences between them. They are merely particular branchlets of the tree of life." Other examples of infra-specific taxa and even populations being treated as terminal taxa in a cladogram are given by Crisp and Chandler (1996). Other authors (Nelson 1989, Vrana and Wheeler 1992) also have this viewpoint that there is nothing unique about the species.

General support probably now exists for the view that species should be the minimal units of terminal taxa in a cladogram (Davis & Nixon 1992), in order to meet the specific conditions formulated by Hennig in his phylogenetic method (Hennig 1966). The variation that occurs below this rank is more

due to the tokogenetic variation of anagenesis, rather than the phylogenetic dichotomy that occurs at cladogenesis, as shown in Fig 6 of Hennig (1966). One method of assessing where genetic traits within populations are distinguished from taxonomic characters that separate species in a phylogenetic hierarchy is that of population aggregation analysis (Davis & Nixon 1992). However, cladistic theory has been applied at the population level (Campbell 1986, references in Crisp & Chandler 1996), but at a time before phylogenetic species concepts were formulated and the implications of applying them appreciated.

In a revision of Malesian *Sporobolus* by Baaijens and Veldkamp (1991), the authors assign varietal rank under *S. indicus*, to a number of entities of the *Sporobolus indicus* complex. However the same entities are assigned species rank for the same taxa in Australia (Simon & Jacobs 1999), as we felt the characters we used could be considered to be fixed in terms of a phylogenetic species concept, although they are very difficult to apply in this genus, where "the occurrence of intermediates seems to be the rule rather than the exception" (Clayton 1974). The need for the use infra-specific ranks to give a degree of formalisation to known infra-specific variations, in whatever way this variation may be caused, is summarised by Stace (1986).

11. Redefinition of terms.

The term **monophyly** predated its use by Hennig (1966), and was generally understood to imply the derivation of a group from a common ancestor. Hennig used the term more narrowly in that it referred to the derivation of a group from a common ancestor that included all the descendants of that ancestor. For those groups which included a common ancestor but only some of the descendants Hennig used the term **paraphyly**. This basic change in meaning of the term monophyly was of concern to some authors (in Minelli 1993), and for this reason the term **holophyly** was proposed by Ashlock (1971) to equate to Hennig's use of monophyly, whereas Ashlock used monophyly to include both holophyly and paraphyly. The use of the term polyphyly was retained by Ashlock to imply the descent of a group from more than one ancestor - an indication of convergence or parallelism (homoplasy).

Conclusion

This book will no doubt become a standard text for the study of plant systematics at university level in the U.S. and beyond for the beginning of the 21st century. The authors have done a really great service to the botanical community in bringing us all

up to date as to how the practice of systematics should be conducted, elevating it onto a more scientific footing from the position of subjective intuition that is still followed in most parts of the world. This has been referred to by Minelli (1993), which despite the title, is an attempt to standardise the way we systematise the whole range of biota in a more scientific way. A quote from a preface to this book states "bad taxonomy... persists[and] cannot be ignored; it must be undone and redone."

The eleven separate issues I have suggested as areas for more detailed discussion are those that have struck me as potentially unresolved issues in some areas of cladistics, particularly the practice of extrapolating a cladistic analysis into a classification without regard for any paraphyletic groups. This may be a reflection of having been a practising herbarium taxonomist for 36 years and a possible reluctance to "give up the traditional aesthetic subjective judgements" referred to by Morrison (1993). They are issues that have produced an abundance of publications in the last 20 years and raised considerable passion by practitioners of different methods of taxonomic practice. One of the issues concerns phylogenetic nomenclature, the desire for a Phylocode (Milius 1999) and the vigour with which its adherents are pursuing this cause. It is difficult to find justification for such a move in an age when taxonomists of any persuasion are becoming a dying breed, in Australia anyway, at the very time that they are needed in terms of the ever present biodiversity crisis.

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OBITUARY

Daphne Pearson

The Australian of Friday July 28th 2000 carried an obituary for Daphne Pearson, GC, who died in Melbourne on July 25th at the age of 89. While Daphne Pearson is most widely known for her bravery in saving the life of a bomber pilot during the second World War, she was also a well known horticulturalist. In an article on Daphne Pearson's horticultural pursuits, Anne Latreille notes that with her friend Mervyn Davis, Daphne "collaborated with botanists Dr Jim Willis and Dr

J.W. Green on a bibliography of collectors and illustrators of Australian plants."

My thanks to Kevin Keneally for bringing this to my attention. Kevin also notes that the bibliography mentioned in this article was published in the *Western Australian Herbarium Research Notes* (1986) No. 12, 1-111.

LETTERS

Willdampia land or be wrecked?

When Thompson, *Telopea* 4(1990)4, transferred Sturt Pea *Clianthus formosus* to *Swainsona* more reasons were given for separating it from the New Zealand genus *Clianthus* than for placing it in *Swainsona*. Thompson stated that Sturt Pea had little affinity with eastern *Swainsona* but was closely related to *S. beasleyana* F. Muell., from which it differs in its usually red (not purple) flowers, acute keel and large fruit. She could also have added *S. maccullochiana* the vegetative parts of which are very like Sturt Pea, though erect rather than prostrate. It has similar thick stems, large stipules and stiffly erect racemes but with numerous flowers and is scarcely distinguishable from Sturt Pea until flowering. Recent research work on Sturt Pea has discovered some surprisingly erect forms in natural populations in Western Australia.

George (1999) has proposed a new monospecific genus *Willdampia* for Sturt Pea on the following basis. He considered that the orientation of the standard and keel, the flower's large size, its typically red petals with a large black boss on the standard and the legume of Sturt Pea being larger than most other species of *Swainsona*, were generic distinctions.

With the genus *Swainsona* the pods range from glabrous, inflated, near spherical, to pubescent, cartilaginous, oblong, with impressed sutures. The pod of Sturt Pea is typical of the latter though larger.

The seeds of Sturt Pea are 3-4 mm long, reniform with a marked hilum notch, shiny, light to dark brown and the surface is coarsely foveate or reticulate-foveate, the ridges smooth and rounded. Exactly the same description could apply to the seeds of *S. maccullochiana* except they are a little longer, 4-5 mm, and are a darker brown.

The cotyledons of *S. maccullochiana* are broadly reniform with an eccentric midvein. Those of *S. formosa* are identical though somewhat smaller.

George notes the large flowers of Sturt Pea, their colour, orientation of the standard, and the acute keel. These are adaptations to bird pollination. Australia has a number of distinguished geanthous bird pollinated legumes of which *Kennedia*, *Brachysema* and *Leptosema* come to mind.

More importantly, a range of pollination mechanisms within one genus is widely accepted.

An exact parallel occurs in *Templetonia* where most species have small or medium sized flowers presumably insect pollinated and *T. retusa* has large dull red flowers considered bird pollinated. In *Crotalaria* most species have small to medium sized yellow flowers and *C. cunninghamii* has much larger greenish-yellow bird pollinated flowers.

In neither case have these exceptions been given generic rank in modern treatments.

A recent paper by Wagstaff *et al.* (1999) included Sturt Pea in an analysis of the classification of a number of New Zealand legumes. The ITS (DNA) sequences were determined for a total of 39 species including 16 Australian *Swainsona* which included at least one species from ten of Thompson's (1933) informal groups. Twelve species of *Swainsona* including the New Zealand *Montigena novae-zelandiae* (previously in *Swainsona*) formed one distinctive clade. Sturt Pea was included with *S. pterostylis*, *S. stenodonta* and *S. decurrens* in a second clade of *Swainsona* distinguished from the first. The results suggest that there may be slight

grounds for dividing *Swainsona*, but they did not support a monospecific genus for Sturt Pea.

The striking flowers of Sturt Pea evoke strong emotional responses, "Sentinels watching, ancient soldiers defending", "bright blood of Passion, black wound of pain", "such savage and scarlet as no green hills dare", "Bright, black-brained scimitars. Cockatoo crests dipped in blood", "it flaunts dark lips beside desert tracks", "let her red and violet flower fill my absence".

These images hardly constitute grounds for generic rank, but have we had more offered by George; colour, size, black boss, orientation? Come on Alex, we need more rigorous evidence before Joining Will Dampier and his buccaneers on the 'Roebuck'.

George, W.A. *Nat.*, 22(1999)191-193
Thompson, *Telopea*, 4(1990)4; 5(1993)422-481
Wagstaff *et al.* *Am. J. Bot.* 86(1999)1346-1356.

David Symon
10 July 2000

The PhyloCode Letter 1

Since you've drawn my attention to the PhyloCode in the June ASBS Newsletter, I'm taking the liberty of sending some comments on Cantino & de Queiroz (2000) PhyloCode: A Phylogenetic Code of Biological Nomenclature. The present draft PhyloCode seems fine for the use of cladists and others whose work relates to phylogenetic classification. I can see the convenience of being able (for example) to label an inferior-ovary clade within Iridaceae, then a spicate-inflorescence clade within that, without using ranks. The authors make a good point that use of terms like family, subfamily and tribe invites the misconception that these ranks have an objective existence. But the PhyloCode will not be understood or used by anyone else - ie, all the people in other branches of biology, agriculture, forestry, conservation, horticulture, physiology, plant breeding etc who are the end-users of taxonomic data.

The promised extension of this Code to include species names will be even less useful. If cladists need their own system of names to label the OTUs on their cladograms - fine. The rest of us can translate, if need be.

But the principles of scientific nomenclature are already poorly understood by its end-users. One ecologist colleague had trouble accepting that a species can have more than one validly published name, or that taxonomists might agree to differ as to which of two genera best includes it. It seems one of his university lecturers told him that the latest name of a species is always the "right" one. Others ask me questions like "Which one is correct - Poaceae or Gramineae?"

The addition of another set of alternative names will not help. (Philip Cantino has pointed out that the PhyloCode will at least decide between pairs of family names such as Poaceae and Gramineae. But I'm afraid this welcome simplification will not be noticed by the general public.)

The public do not like plants to change their names. At the moment, I'm drafting changes to the proclamation of some noxious weeds under State legislation: *Homeria* spp. (Cape tulips) now have new combinations in *Moraea*, and *Myrsiphyllum* spp. (bridal creepers) have been sunk in *Asparagus*. These legal changes will have to be approved by the Animal and Plant Control Commission, and then by

State Cabinet. Although there is sound reasoning behind the widened circumscription of *Asparagus* and *Moraea* (good enough to convince even a sceptic like me), it's not easy to justify this to the farmers, public servants and politicians.

As others have pointed out, the claim that redefining names of clades, and by implication supraspecific taxa, in terms of phylogenetic relationships will make for greater stability is naive. Any phylogeny is hypothetical, because it must be based on inference instead of direct observation, and will remain subject to revision by later researchers.

The authors refer to "the preexisting codes (i.e., International Code of Botanical Nomenclature (ICBN), International Code of Zoological Nomenclature (ICZN), International Code of Nomenclature of Bacteria: Bacteriological Code (BC), International Code of Virus Classification and Nomenclature (ICVCN))" But why no mention of

the International Code of Nomenclature for Cultivated Plants? The ICNCP is explicitly non-phylogenetic, in that it does not require cultivars to be monophyletic. Cultonomy is a developing area - demarcation disputes between the ICNCP and ICBN are still being addressed and we still have such problems as wild species that were first described from a derived cultivar (eg. *Rosa banksiae*). Again, an additional code and set of names is not going to clarify anything.

Overall, the PhyloCode concept seems parochial - the idea of specialists who are considering only their own line of research.

Regards,

David Cooke

Letter 2

As one of the two primary authors of the draft PhyloCode (<http://www.ohiou.edu/phylocode/>), I would like to comment on a few points in David Cooke's letter.

Expressing the concern that the PhyloCode will replace existing names with new ones, Dr. Cooke states: "Others ask me questions like 'Which one is correct - Poaceae or Gramineae?' The addition of another set of alternative names will not help." This concern is unfounded. The PhyloCode will not add "another set of alternative names" because it will not change existing names that already refer to clades. Since the taxon that is referred to today as Poaceae or Gramineae is a clade, one of these two names (but not both) would be adopted under the PhyloCode. Thus, users would not have to learn yet another alternative name, as he suggests. On the contrary, users of the PhyloCode would have only one correct name to deal with (either Poaceae or Gramineae, whichever ends up being established under the PhyloCode), whereas users of the International Code of Botanical Nomenclature (ICBN) would have two. The example Dr. Cooke picked is one for which the PhyloCode would actually simplify nomenclature, but in most cases there is only one correct name for a taxon under the ICBN, and that same name would be used under the PhyloCode.

There will, of course, be clades that are named only under the PhyloCode, just as there will be monotypic and paraphyletic taxa that are named only under the preexisting codes, so the total number of names in the literature will increase, but I don't think this is a problem. The important thing is that the number of correct names for a particular taxon will not increase due to implementation of the PhyloCode.

Dr. Cooke goes on to note that "The public do not like plants to change their names." The developers of the PhyloCode share this concern about nomenclatural stability. Indeed, species names under the PhyloCode will be much more stable than under the current system because it will not be expected that information about relationship will be conveyed by the name itself. Instead, an optional "clade address" may be cited with the species name to indicate its relationship. For example, the Australian plant *Huxleya linifolia*, the only member of its genus, is closely related to *Clerodendrum* (R. de Kok et al., Austr. Syst. Bot. 13: 425-428 [2000]). Under the PhyloCode, its name might be converted to *Huxleya-linifolia*. This would be its permanent name and would not be intended to imply relationship. If it were subsequently found that the sister group of this species is a species of *Clerodendrum* (which is not unlikely) many systematists using the ICBN would want to change its name to *Clerodendrum linifolium* in order to avoid paraphyly of *Clerodendrum*. However, under

the PhyloCode, its name would remain *Huxleya-linifolia*. If one wanted to show its relationship to *Clerodendrum*, this could be done by citing *Clerodendrum* as a clade address: for example, *Clerodendrum/Huxleya-linifolia*. However, *Clerodendrum* is not part of the name and its inclusion is optional. If might, for example, be cited only once in a particular paper.

It has not been decided what format species names will take under the PhyloCode, and various possibilities are discussed in a paper in *Systematic Biology* (48: 790-807 [1999]). In all cases, though, the names would be more stable than Linnaean binomials. Thus, people who object to changes in species names are likely to prefer phylogenetic nomenclature.

Dr. Cooke argues that "the claim that redefining names of clades, and by implication supraspecific taxa, in terms of phylogenetic relationships will make for greater stability is naive. Any phylogeny is hypothetical, because it must be based on inference instead of direct observation, and will remain subject to revision by later researchers." New information about phylogeny leads to changes in the content of taxa under both phylogenetic and traditional nomenclature. However, there is an additional source of nomenclatural instability that occurs only under the traditional system, and that is name changes due to shifts in rank. Under the ICBN, if a clade is shifted from the subfamily to family rank, for example, the rank-based ending of the name will necessarily change, and in some cases the whole name must change due to application of priority within rank.

There are plenty of examples of radical changes in the taxonomic content associated with names under the current system as a result of new phylogenetic hypotheses. The finding that the family Lamiaceae is polyphyletic as traditionally circumscribed (Cantino in *Ann. Missouri Bot. Gard.* 79: 361-379 [1992]; Wagstaff & Olmstead in *Syst. Bot.* 22: 165-179 [1997]) has led to the transfer to the Lamiaceae of many genera formerly placed in Verbenaceae

(including all of the Chloanthoideae). More recently, research by Olmstead et al. (*Amer. J. Bot.*, in press) has shown that the family Scrophulariaceae is polyphyletic as traditionally circumscribed. It therefore will have to be divided up into several families. The one that contains *Scrophularia* is relatively small, so the content associated with the name Scrophulariaceae will shrink drastically. Many genera formerly placed in Scrophulariaceae belong to a well supported clade that also contains *Plantago*. If this is named as a family, it must be called Plantaginaceae under the ICBN, drastically increasing the size of that family.

Finally, Dr. Cooke wonders why the draft PhyloCode does not cite the International Code of Nomenclature for Cultivated Plants (ICNCP) as one of the preexisting codes. This is a matter of context. The importance of the preexisting codes from the standpoint of the PhyloCode is that they govern the preexisting names that will often be adopted for clades or species under the PhyloCode. The ICNCP is not mentioned because it deals largely with taxa below the species level, and the PhyloCode will not cover infraspecific taxa. For preexisting plant names at and above the species level, the draft PhyloCode follows the ICBN.

Dr. Cooke states that "the PhyloCode will not be understood or used by ...the end-users of taxonomic data." He may be right in the short run, but if, over time, phylogenetic nomenclature becomes widely used by systematists, the end-users of taxonomic data will gradually learn about the system and may well come to appreciate the greater stability of taxonomic names under this system.

Sincerely,

Philip Cantino
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CONFERENCES

Gardens 2001 Congress 'Public Gardens in the 21st Century: Conservation, Culture or Crass Commercialism?'

Hosted by Council of Heads of Australian Botanic Gardens and the Australian National Botanic Gardens

Canberra 17-21 April 2001

The Gardens 2001 Congress will be held at the Manning Clark Centre, Australian National University, Canberra from Tuesday afternoon 17th to Saturday 21st April, with a field trip planned for Saturday afternoon and Sunday 22nd April, 2001.

Australia's botanic gardens are places where nature and culture converge. They showcase the plants of Australia and the world in beautiful settings, provide for recreation and serve important conservation and research functions. As we enter the new millenium, government agencies are expecting value for money, modern management techniques and innovative funding. It is time to

review and plan how best to make public gardens relevant to the changing needs of the community and to optimise their contribution to the conservation of the world's plant biodiversity. The Gardens 2001 Congress will seek to position botanic gardens in the new millenium, exploring the areas of Horticulture, Plant Sciences & Conservation, Public Programs and modern management practices.

For more information, contact:
Australian Convention and Travel Services (ACTS)
Acting as agent for Gardens 2001 Congress
GPO Box 2200
Canberra ACT 2601

Largest leaf?

On a recent trip to Melville Island (just north of Darwin), Raelee Kerrigan and Kym Brennan collected some leaves from a tree they were unable to identify. Closer examination at the Herbarium suggested it may be a *Garcinia*, a genus never previously collected in the NT. Raelee sent it over to Bernie Hyland at Atherton, who confirmed it was indeed *Garcinia warrenii*, a species previously only known from Cape York and Papua New Guinea.

It was quite common in a dry monsoon forest on a hill surrounded by mangroves. Melville Island has been fairly well botanically surveyed over the years, but it appears this hill has escaped examination because the only practical way to

reach it is by boat. Over the past few years we have occasionally collected taxa new to the NT, and been excited about it, but to get a relatively large new tree was a real bonus.

Also at Melville Island we picked up a leaf of *Corymbia ptychocarpa* measuring 50cm long by 24cm wide (and have kept it to prove it!). We are interested to know if anyone knows of a *Corymbia* leaf bigger than this (if so e-mail Bob Harwood - bob.harwood@nt.gov.au).

NEWS FROM FASTS

Media release on Innovation Summit Implementation Group Blueprint for Jobs

The report of the Innovation Summit Implementation Group (ISIG) has been greeted warmly by Australia's scientists and technologists.

Professor Sue Serjeantson, President of the Federation of Australia's Scientific and Technological Societies (FASTS), said all attention will now be on the Government to see how it responds.

"The Government has two important reports on the table, those of ISIG and Chief Scientist Robin Batterham. Together they provide an integrated package for an innovative modern economy," she said.

"And taken together, they set out a blueprint for Australia's future in what will be the most competitive century in modern history."

"David Miles (Chair of ISIG) and Robin Batterham have pointed Australia in a bold new direction. It is up to Australia to take advantage of their wisdom."

Professor Serjeantson said that many of ISIG's 24 recommendations have long-term national implications.

"To be fully effective, these recommendations need the broad support of all parties," she said. "There is room for healthy debate over which road we take, but we need national agreement on the destination."

"That destination has to be an Australia whose employment future rests on the bedrock of science and technology."

"It's hard to think of worthwhile, high-pay, sustainable jobs in the coming century that do not depend on science and technology."

"Unless we embrace the general thrust of these reports, we are putting in jeopardy the job prospects of the next generation and the one after that. Australia will become a curiosity, a cute place for tourists to admire the wildlife."

Professor Serjeantson said that earlier this year, FASTS urged the Government to introduce a mini-Budget to address this most urgent of national problems.

"We repeat that call. Australia's comparative position in the world pecking order has sagged in the last few years, and we can't afford to let it slip further" she said.

She said FASTS particularly applauded ISIG proposals to
... double the funding of the Australian Research Council
... provide tax breaks for small innovative companies
... give a massive boost to research infrastructure

"But this is a package," she said. "It's not a matter of picking and choosing among the recommendations - they fit together as a plan for future jobs."

A Terrible Set of Numbers

New figures released today (Monday) by the Australian Bureau of Statistics show that Australia's expenditure on Research and Development slumped ten per cent against GDP in the two year period from 1996-97 to 1998-99.

These were the worst results in an international comparison of seventeen OECD countries.

Gross Expenditure on Research and Development (GERD) is now back to the levels last experienced in Australia in the early 1990s.

Professor Sue Serjeantson, President of the Federation of Australia's Scientific and Technological Societies (FASTS), said Australia ranked sixth last internationally. Each of the countries below Australia improved their national investment in R&D.

"We are going against the tide of informed international opinion," she said.

"Japan, Finland and the US all spend twice as much as Australia. Every country in western Europe, from the minnows to the giants of the industrial world, is spending more on R&D than Australia."

The only exception is Spain, but even so Spain increased spending by ten percent as Australia fell back by the same amount.

Professor Serjeantson said that although Australian investment in R&D has fallen steadily since the Coalition Government came to power, it is too early to write this Government off.

"The new capital gains tax system is a positive step, and the Government is about to respond to two major reports into science and technology," she said.

"The Batterham Report and the Report of the Innovation Summit Implementation Group offer a major opportunity for the Government to reverse this decline into economic irrelevance."

"It represents a once-in-a-decade opportunity."

"The Prime Minister said at the Innovation Summit that we should judge his Government by its actions. We accept this."

She repeated her call for a new investment in Australia's research effort of one billion dollars.

"I'm talking about jobs, new industries for the next generation, solutions to our environmental problems, and an Australian dollar that can hold its head up overseas," she said.

"It's time for the empty rhetoric to stop."

"Excellence must be combined with relevance"

The Batterham Review

The Chief Scientist's Science Capability Review has been greeted with enthusiasm by Australia's scientists and technologists.

Professor Sue Serjeantson, President of the Federation of Australia's Scientific and Technological Societies (FASTS), said Chief Scientist Robin Batterham has identified many of the outstanding science issues where Australian investment lags behind other countries

"Basically, it's a terrific report," she said. "Robin Batterham is spot-on in his analysis of where we need to invest so Australia can build itself a future."

"The Report is a clever balance, calling for greater national investment in people, in ideas, and commercialisation. We do need to find new ways to do things."

"Robin Batterham has set a clear direction for Australia's Modern Economy."

Professor Serjeantson said the Review picked up almost all the issues FASTS has been urging the Government and industry to act on over the past five years.

"We are pleased to see calls for:
* increased investment in basic research
* measures to stop the brain drain
* boosting science education for our kids
* investment in national innovation infrastructure"

"The Reports as it stands is literate, but it's not yet numerate," she said. "It needs dollar figures added."

She urged the Government to move swiftly to implement the recommendations of this Review when

it resumes in late August. By then the recommendations of the Innovation Summit Implementation Group will be in the hands of the Government.

"The next decade belongs to Science and Technology. The world is undergoing a revolution bigger than the industrial revolution," she said. "That is what

the Chief Scientist recognises. The Review is a blueprint for exciting jobs for all our young people."

Professor Serjeantson said that FASTS will respond in detail to Dr Batterham.

The Review has been posted on the ISR website at: www.isr.gov.au

New ALP Policy Welcomed

Australia's peak council of scientists and technologists welcomed the policy announcement by the Labor Party that a Labor Government would double the number of research fellowships open to Australian scientists.

Professor Sue Serjeantson, President of the Federation of Australia's Scientific and Technological Societies (FASTS), said today (Thursday) the policy release comes at a crucial time.

She labelled it "an important contribution to the debate on Australia's future", and said doubling research fellowships would help address the 'braindrain' issue.

"The braindrain is a bio-indicator of the health of the Australian research and innovation system," she said. "If people are leaving the country in droves, it shows our national settings aren't right."

Professor Serjeantson said two major reports on science and innovation are due to be released this month - the Chief Scientist's Review of Australia's Science Capability (mid August), and the report of the Implementation Group of the Innovation Summit (31 August).

"The minds of the policy-makers are focussed on the best possible return for Australia from our national

investment in science and technology," she said.

"The policy announced by the Labor Party is a useful contribution to these discussions, and sets a benchmark."

She expressed the hope that Australia might move towards a bipartisan approach to the broad picture governing the national investment in science and technology.

"Science policy should be stable but not static," Professor Serjeantson said. "It has to be predictable so industry and researchers can plan with confidence for the future. Many science-based processes take a decade to come to fruition."

She was critical of a tendency for incoming Governments to undo programs put in place by previous administrations, whether the program had merit or not.

"Science policy should not become a political football," she said. "It affects the lives of many talented young Australians now. We need long-term planning that goes beyond the next election cycle."

Turning half chances into the knowledge economy

Australia is "well on the way" towards being a knowledge nation, but a long way from having a knowledge economy.

What it needs, according to Professor Sue Serjeantson, is a new national resolve to turn the half-chances and the missed opportunities into skilled, creative, well-paid jobs.

Professor Serjeantson, President of the Federation of Australian Scientific and Technological Societies (FASTS), made the remarks while opening the forum "Science and technology in the Boardroom" at the National Press Club in Canberra today (Wednesday).

"Australia is on the right track in policy terms, but we're doing it all in slow motion," she said. "It's hard to be patient when you see the rest of the world moving along so quickly,"

She said the main aim of the forum was give impetus to a process of transforming the way the Australian economy works.

"Industry needs a technology boost at the highest level," she said. "We need to change industry's mindset, so boardroom discussions are about the next ten years rather than last month's

correspondence. It's about sustainability rather than the bottom line."

"Company boards need a judicious injection of scientists and technologists so they can take advantage of the opportunities offered by a technology-driven world. They need to raise their level of comfort in dealing with new concepts and new possibilities offered by technology."

Professor Serjeantson said that the next twelve months offered a "once-in-a-decade" opportunity for Government to get the national settings right, with two major science and innovation reports due and a budget surplus looming.

In a blunt message to the Forum, she said the outcome had to include additional national investment in the infrastructure surrounding innovation.

"It is a necessary and prudent investment in our future, so that we can maintain our high standard of living in a sustainable way through the next century," she said.

A.S.B.S. PUBLICATIONS

History of Systematic Botany in Australia

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

For all those people interested in the 1988 A.S.B.S. 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

A.S.B.S. Newsletter Number 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*.

Ecology of the Southern Conifers

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.

Australian Systematic Botany Society Newsletter

Back issues of the Newsletter are available from Number 27 (May 1981) onwards, excluding Numbers 29 and 31. 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.

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Evolution of the Flora and Fauna of Arid Australia

Edited by W.R. Barker & P.J.M. Greenslade. A.S.B.S. & A.N.Z.A.A.S., 1982. \$20 + \$5 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.

Special arrangement: To obtain this discounted price, post a photocopy of this page with remittance to: Peacock Publications, 38 Sydenham Road, Norwood, SA 5069, Australia.

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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 and forwarding it, with the appropriate subscription, to the treasurer. Subscriptions become due on January 1 each year.

The Newsletter

The *Newsletter* appears quarterly, 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.

Contributions should be sent to the editor at the address given below. They should preferably be submitted as: - an unformatted word-processor file on an MS-DOS or Macintosh diskette (Microsoft Word 6 or an earlier version is preferred), accompanied by a printed copy; as an email message or attachment, accompanied by a fax message reporting the sending of the file; or as two typed copies.

The deadline for contributions is the last day of February, May, August and November.

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

Notes

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