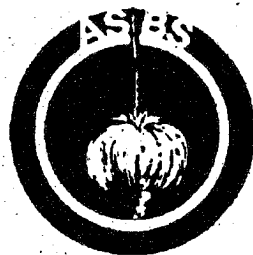


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PRESIDENT'S REPORT

Funding for systematics

With continuing cuts to Environment Australia's budget, and in particular to the Australian Biological Resources Study, it is a sobering time for Australia systematists. Will any of the money from the sale of Telstra go to research? At this stage it seems unlikely we will get more than a few crumbs. I wrote recently on behalf of ASBS to Senator Hill, registering our concerns about cuts to ABRS. Such letters are necessary and sometimes lead to change, but they are not enough.

It is equally important that we lobby on behalf of systematics in our own institutions, whether they be universities or herbaria/botanic gardens. Is it enough to say that you study a particular genus because it is poorly known, or because you suspect there are half a dozen undescribed species? There are hundreds of vascular plant genera like that. Why are you working on a particular genus? Is it because the genus has important implications in biodiversity conservation? Will your research lead to sustainable use of natural resources? Will your studies provide fundamental advances in our knowledge of evolution and the origins of life on earth? I'm sure other reasons spring to mind...

We have a duty to sell systematics to the government, to the general public and to our colleagues. Talks and seminars must be exciting and persuasive. Our research results must be explained and interpreted in ways that everyone can understand. It is quite reasonable to be asked why systematics is important, why it should be supported by government funds

and our institution, and why we study one plant group and not another. Lobbying and spruiking certainly take time away from our core business, but it is our responsibility to convince the widest possible audience of the value of our science. If systematics continues to decline it is not solely the fault of government or voters, systematists must share the blame.

Newsletter

I recently sent out an urgent call to all chapter conveners and councillors, seeking a new editor (or brood of editors). The Darwin team, now ably led by Philip Short, have announced that after the December issue they want out. There has been one nibble from the opposite extremity of Australia, but if there is an enthusiastic editor somewhere in between, the job is theirs.

As newsletter editor you keep in regular contact with ASBS members from all over the place. You keep up with what is happening in ASBS, plant systematics and (through the FASTS bulletins) Australian science. Even better, you get to inflict your wit and wisdom on a witty and wise audience. If you have any aspirations towards science journalism, or just plain enjoy writing or editing, give it a try.

While waxing on this subject, I should also lobby for contributions to the newsletter. Apparently everyone in the society agreed with Chris Quinn's recent letter. No one has concerns about cuts to the ABRS budget. Nothing interesting, touching or funny happens in plant systematics in Australia. And was

there really an ASBS conference in Melbourne last year?

Hansjörg Eichler Scientific Research Fund

With too little fanfare, the application forms for the inaugural Eichler Fund grants were included in the last newsletter. Applications were due in by 12 June and the successful candidates will be announced at the Adelaide conference. The full Council will act as selection panel (except on applications where there may be a conflict of interest). We propose to favour honours and post-graduate students, or newly established botanists, to keep with the spirit of the proposals discussed at various council meetings over the years. Inevitably we will learn from this first selection process. The lack of background information in the newsletter is certainly one aspect which will have to be improved next time.

It is opportune to thank again Marlies Eichler for her establishment of, and substantial contributions to, this fund. If anyone would like to join Marlies in fostering the research of young and new systematic botanists, please send donations to the Treasurer. Tax deductibility for the fund is currently under investigation.

National Biodiversity Council

I neglected to mention in the last newsletter that Peter Weston is another ASBS member in the NBC assembly. He was chosen as an independent member. Although he does not represent the society, I am sure he will happily relay the concerns of society members. Our society representatives are Bob Hill and Darren Crayn.

Conferences

ASBS has been invited to participate in the next

International Botanical Congress, to be held in St Louis, USA, in August 1999. In particular, the organisers have called for topics for symposia. A HISCOM-based session has already been suggested. If you are interested in finding out more about the Congress or in contributing to the program for the Congress, look at the website <http://www.ibc99.org>.

You might also consider where ASBS might meet in 1999, and how or if that meeting should relate to the IBC. There are a few options. The Society of Australian Systematic Biologists (SASB, rather than the unfortunate acronym ASS I inadvertently chose last time) is at present organising its future conference program and we could plan another meeting with them (but where?). Bob Hill has floated the idea of a pair of symposia focusing on systematics to be jointly hosted by the Korean Botanical Society and ASBS. The proposal involves a meeting in South Korea next year, with a follow-up in Australia in 1999. This may have an impact on any meeting of ASBS associated with Monocots II in Sydney next year.

Historical proposals abound. We could commemorate Dampier's landing in Western Australia with a conference in Perth (or maybe Dirk Hartog Island to tie in even more history) in 1999. Reenactments of the Flinders voyage are proposed for the year 2002, and ASBS clearly has a role in these. It has been noted that Australian cities in need of an ASBS conference include Alice Springs, Darwin, Armidale and Townsville. Plenty to think about before the ASBS meeting in Adelaide. If you have ideas or suggestions contact your chapter convener or an ASBS councillor.

Tim Entwisle

ASBS INC BUSINESS

PAROO RIVER

In my capacity as secretary of the Society, an invitation has just (4th June) been received from the Paroo River Association to attend a Scientific Workshop to be held in Hungerford, Queensland, from 7th-9th July 1997. Its text reads as follows.

"The workshop is a result of concerns raised by the Paroo River Association over water management of the Paroo River. It is our understanding that there are currently 2 applications for commercial irrigation submitted for consideration by the Department of Water Resources in Queensland. The extraction of substantial of water from the Paroo would have disastrous consequences for all downstream and the fragile ecology of the river. The Paroo River remains the only river in the Murray-Darling Basin untouched by such water management.

We hope the workshop will provide the local community with information which will guide decision-making processes within government which aim to manage river systems. The Queensland Government is considering a Water Allocation Management Plan for the Paroo River about the time of our workshop, so recommendations from the workshop will be extremely valuable for this process.

We would like to have 2 days of papers delivered by about 15 scientists. The third day would be allocated to talks by landholders, government and other interested parties. In the afternoon of the third day we would like to have a discussion of the problem, followed by some recommendations."

Participating speakers include Professor Brian Timms (Geography, Newcastle University), Dr John Pickard (Environmental Planning, Macquarie University), Dr Bill Young (CSIRO Land & Water, Canberra), Dr Martin Thoms (CRC for Freshwater Ecology, Canberra University), Dr Sue Briggs (NSW NPWS), Mr Jim Puckeridge (Zoology, Adelaide University), Dr Stuart Bunn (Catchment and In-Stream Research, Griffith University), Dr Margaret Brock Botany, University of New England), Dr Michelle Casanova (Botany, University of New England), Dr Jane Roberts (CSIRO Land & Water, Canberra), Dr Andrew Boulton (Zoology, University of New England), Dr Richard Kingsford (NSW NPWS), Dr Peter Fairweather (CSIRO Land & Water, Griffith) and Mr Mark Morrison (Economics & Management, University of NSW).

Unfortunately I will be unable to attend and by the time this newsletter is distributed the workshop will be over.

As a footnote, members might be interested in Siobhan McHugh's book 'Cottoning On', published in 1996 by Hale & Ironmonger, Sydney and brought to my attention by David Symon. It is an historical account of the experiences of cotton growers in New South Wales and provides an insight of what the Paroo River Association might well face in the future.

Robyn Barker

[A review, by David Symon, of 'Cottoning On' was received after the above was written and is published herein.]

LETTERS TO THE EDITOR

DISTRIBUTION OF FUNDS UNDER THE ABRS PARTICIPATORY GRANTS PROGRAM

Dear Dr Short,

Thank you for forwarding a copy of Alex George's open letter to me, as published in issue 90 of the ASBS Newsletter. His letter criticises the 1997 distribution of funds under the Australian Biological Resources Study's Participatory Grants Program.

In seeking to respond to his criticism, I have framed my reply around the following three questions:

1. What has been the policy basis for the traditional 50:50 split between 'flora' and 'fauna'.
2. Is this current (1997) deviation from the 50:50 split the result of a shift in policy on the part of Environment Australia, ABRS or the Advisory Committee?
3. Is it the intention of the Advisory Committee, as argued by Dr George, to redress '... this situation by reversing the proportions for 1998 grants, and thereafter return[s] to equivalent funding'?

In answer to the first question, enquiries made of the present Secretariat and of some past members of the Advisory Committee suggest that the equal distribution of grant funds between flora and fauna has been a long-standing practice, but one based on precedent

rather than policy. This distribution has been questioned by individual members of the Advisory Committee from time to time (including during the period of my Chairmanship) but, until last year, was not departed from to any significant extent.

The second question requires an understanding of the triennial nature of most ABRS grants. When a grant is made, there is a tacit understanding that, subject to satisfactory reports on progress *and* the availability of funds from the Government, the project will be supported for three years. This means that projected triennial funding is based in part on anticipated grant renewals, and so must be adjusted each year if the annual allocation to ABRS falls short of the amount provided for in the forward estimates. This happened in 1996/97, at a time in the three-year cycle when the renewal commitments for 'fauna' for 1997 exceeded those for 'flora'. It was this problem which led to the 44% (flora):56% (fauna) split to which Dr George takes such exception.

However, by the very nature of the process, this situation is soon to be reversed. While flora renewals for 1998 total \$330,000 compared with fauna renewals of \$395,000, renewal commitments in 1999 are \$199,000 for flora but only \$64,000 for fauna. Also, nine new flora grants were awarded in 1997 totalling \$246,000 (plus an additional \$65,000 for herbarium loans, etc.) compared with five new fauna grants totalling \$54,190 (of which three were for \$2,000 or less).

Until now, the Advisory Committee has nearly

always given grant renewal commitments priority over new grants. Whether, given the diminishing allocation to ABRS by Government, this policy can or should be maintained will doubtless be explored by the Advisory Committee at its August meeting. But I would stress that the unequal allocation to flora and fauna for 1997 was the pragmatic result of differences in renewal commitments and was not a decision, *in principle*, to give a higher proportion of grant funds to fauna.

Let me now turn to my third and final question. The Advisory Committee, as indicated in the previous paragraph, made no *in principle* decision to depart from a 50:50 split between flora and fauna. However, Dr George's letter, and a major shortfall in anticipated funding for 1997/98, will both be on the agenda for discussion at the August meeting of the Committee. I will certainly advise you and your readers if the Committee proposes to depart from past practice in the allocation of funds under the Participatory Program.

Finally, it is probably only fair that I inform your readers and Dr George of my personal views on the underlying issues in his criticism.

Dr George suggests that 'one can argue inconclusively ... whether the botanists or zoologists have the bigger task in discovering and classifying our large biota ...'. While I'm sure that most Australian biologists would agree that both botanists and zoologists still have massive tasks ahead of them in discovering and classifying their respective components of our biota, there can surely be little disagreement that the diversity represented in 'zoology' is very significantly greater than that represented in 'botany'. One needs only quote the estimated species diversity figures provided in *Australian*

State of the Environment 1996:

Protozoans	65,000 species
Fungi	160,000 species
Bacteria	40,000 species
Plants	42,000 species
Animals	335,000 species

It is pertinent to compare these numbers with the numbers of new grant applications received by ABRS for 1998:

Flora	37 applications totalling \$1.74 million
Fauna	79 applications totalling \$3.18 million

While neither of these sets of figures automatically suggest to me that taxonomic research on 'fauna' should be given greater support than that of 'flora', they, combined with the grant situation I have described above, do suggest to me that Dr George's claim that *any* departure from a 50:50 split of funds represents a 'slap in the face to the botanical community' is vexatious hyperbole.

My view is that it is high time that ABRS abandoned its flora/fauna split (which continues to be reflected in its granting processes, editorial committees and publications), including a futile and intellectually dishonest attempt to fit microorganisms into a flora/fauna framework. Funding priorities should surely be set on the basis of national and international goals and needs, and not on some taxon-based demarcation dispute.

I believe that Alex George's letter has done ABRS a great service in catalysing debate on the issue. I look forward to learning of the views

of the broader biological community, including both taxonomists and end-users of taxonomic information.

Hal Cogger,

Chairman,

Australian Biological Resources Study Advisory Committee

16 June 1997

ON THE PROPOSED SOCIETY FOR SYSTEMATISTS

The President has asked for comment on the proposed society for systematists. I believe that we do not need another society, or a differently constituted ASBS. ASBS has served the taxonomic community very well, and its strong membership shows that there is still a need for it. From the start, our constitution has allowed membership to anyone interested in systematics, and we have some non-botanical members. I am not at all sure that, by moving towards a 'mixed' society, our interests would be served any better. If anything they could well become diluted or submerged. We already have difficulty promoting our science in the wider community.

For those who feel that ASBS is not fulfilling their needs, why not approach the Society's Council or their local chapter with proposals for new activities? That is far more practical than

setting up another organisation and spreading our already-stretched resources further.

The conference in Adelaide in September-October will take place whether or not there is another systematic society.

I have always felt that, in general, Australia's botanists liaise very well, among themselves, with other disciplines, and internationally. My impression is that zoologists do less well in this respect (there is no Australian Systematic Zoology Society or equivalent), and have less respect for botanists and their task (that might draw some response!).

So, if there is to be a new society, let it flourish if it can, but let it flourish alongside ASBS.

Also, before getting involved with the Australian Institute of Biology, we should know just what that entails. For example, does it take a proportion of the subscription to cover its costs in handling another society's finances? How does it 'handle professional accreditation', indeed just what does that mean? Unless a clear advantage to ASBS can be demonstrated, we should steer clear of handing it any of our management.

Alex George,

'Four Gables',

18 Barclay Road,

Kardinya, Western Australia 6163

***** 1997 ASBS SUBSCRIPTIONS ARE NOW DUE *****

CONFERENCES

ADELAIDE CONFERENCE '97 UPDATE

Organisation of the joint ASBS and Systematic Biology Conference in September is proceeding smoothly and registrations have started to roll in, including some from overseas. Remember that registrations before July 4th will give you a saving and help us in organising the programme.

Unfortunately Lawrie Johnson will be unable to deliver the Nancy Burbidge Memorial Lecture as advertised, due to ill health.

The title of Andrew Beattie's address is "Biodiversity: taxonomic partnerships".

For those of you who may have had difficulty in accessing the ASBS web page, the address as given in the brochure is correct, except that the 'www' should be omitted. The telephone number for Robyn Barker is also incorrectly quoted and should read (08) 8228 2348.

By the way the 'Ngapartji Software demonstrations' scheduled for the Sunday afternoon and repeated on the Tuesday evening

are not some exotic Japanese software, as suggested by one correspondent, but merely the address for the holding of demonstrations of the various ways in which software can be of significant benefit in the processes and products of systematics. The Ngapartji Multimedia Centre is in East Rundle St amongst all of the coffee shops and eateries of the area and close to the main conference venue.

Some ASBS members have expressed the fear that we will be taken over by the newly formed Systematic Biology Society, but we feel that this joint conference, like other joint conferences in which ASBS has participated, can only be of benefit to our members. Such conferences demonstrate that ASBS is alive and well.

We look forward to seeing you at what promises to be a lively and stimulating programme.

REMEMBER: A LATE FEE APPLIES TO REGISTRATIONS AFTER JULY 4TH.

Bill & Robyn Barker and Laurie Haegi
[Received 10 June 1997]

ARTICLES

SOME AUSTRALIAN MYRTACEAE SPECIMENS HELD AT GENEVA HERBARIUM (G)

A. R. Bean

*Queensland Herbarium, Meiers Road,
Indooroopilly, Queensland, 4068.*

The curator of the Geneva Herbarium recently sent me, on loan, 345 Australian specimens of unidentified Myrtaceae. The majority of these specimens were collected in the 19th century. I have studied all of the specimens and have been able to provide identifications for nearly all of them, at least to the genus level. Most specimens were attributed to James Drummond, Hugh Cuming, Franz Sieber and Auguste LeJolis.

James Drummond (1784-1863)

The loan included 144 specimens collected by Drummond. Drummond numbered his collections but it is clear that he did not number his specimens in the sequence he collected them. Rather, after each major field trip, he arranged his collection in systematic order and numbered them accordingly. Hence all the *Melaleuca* species of a collection are grouped, and adjacent to them are *Beaufortia* and *Calothamnus*. Drummond's taxonomic skills are quite evident when a sequentially numbered group of specimens is examined. Unfortunately, Drummond decided to restart his numbers from 1 for each field trip. Hence No. 132 may refer to several different specimens, depending on the trip on which it was collected.

Specimens from each of Drummond's trips are present at G, but especially numerous are those

they received in 1848. This collection is often referred to as the '5th colln., Drum. V or colln. V'. About 60 types were identified from the Drummond collections in the loan material. Most of these were of names described by Turczaninov. Marchant (1990) gives a comprehensive list of these. I agree with Marchant's enumeration with one exception: the type of *Tetrapora verrucosa* Turcz. is coll. 5: 127, rather than 5: 137 as cited by Marchant. The correct number is given by Toelken (1996).

Hugh Cuming (1791-1865)

There were 65 unnumbered specimens that were attributed to Cuming present in the loan. Most were collected at King George Sound [Albany, W.A.] in 1860. A few were collected from eastern Australia, *i.e.* 'Sandy Is., Austral. or.', in 1859. From the species collected, this location must be somewhere in present-day N.S.W. There is no previous record of Cuming having collected specimens from Australia (Lanjouw & Stafleu, 1954). No types were identified.

Franz W. Sieber (1789-1844)

Twenty four numbered specimens collected by Sieber from the Sydney and Blue Mountains area were present in the loan, including nine type specimens. Probably a complete set of Sieber's specimens is present at G. Although the loan was of undetermined Myrtaceae material, the type of *Pseudanthus pimeleoides* Spreng. (Euphorbiaceae), Sieber No. 292 was present.

Auguste F. LeJolis (1823-1904)

Seven unnumbered specimens collected from Sydney in 1879. There is no record of LeJolis

having otherwise collected specimens from Australia (Chaudhri *et al.*, 1972). No types were identified.

Other collectors represented by small numbers of specimens include Caley (New Holland), Labillardière (New Holland), Latrobe (Port Philip), James Mangles (Swan River), F. Mueller (Victoria), J.A. L. Preiss (Swan River), E. G. Pritzel (Western Australia), W. Stephenson (Sydney), Thozet (Rockhampton) and J. P. Verreaux (N.S.W. and Tasmania).

Types in many Myrtaceae genera were identified. The accepted names of the genera, and the number of types found in each genus, are listed below:

Agonis 2
Astartea 1
Babingtonia 4
Baeckea 4
Balaustion 1
Beaufortia 3
Calothamnus 2
Calytrix 3
Chamelaucium 2
Conothamnus 1
Darwinia 1
Hypocalymma 3
Kunzea 5
Leptospermum 3
Melaleuca 27
Micromyrtus 3
Ochrosperma 1
Regelia 1
Rinzia 2
Scholtzia 2
Thryptomene 1

Further details are available from the author upon request.

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A SIMPLE EXPERIMENT CONJURES UP MORE PROBLEMS

Hellmut Toelken

State Herbarium of South Australia,
North Terrace,
Adelaide, S.A. 5000

The African *Carpobrotus edulis* and American *C. chilensis* (previously included in *C. aequilaterus*) have been cultivated for a long time in Australia. Drummond (1843, *J. Bot. (Hooker)* 2: 174) described the former as already well established in 1842 near Freemantle. Both are often used now to re-establish coastal vegetation. They are easily distinguished from Australian species by the combination of their large protandrous flowers (usually more than

2 cm in diameter at the base of the perianth), auriculate outer perianth lobes, and single fruit remaining erect. *C. chilensis* and usually also its hybrids are readily distinguished by its branches being usually tinged red to deep purplish-red, apart from their purplish petaloid staminodes.

They grow in a wide range of habitats and for a month I admired the display of colour of plants of *C. chilensis* in a roundabout on the way to work. When I once stopped to investigate the variation in this group of plants I noticed that none of the flowers had set seed. At first I could not explain this phenomenon until I remembered that a succulent collector had once told me of some members of the family Aizoaceae which are strongly self-sterile. In order to test this I placed in their midst a tray with flowering male plants of *C. rossii*. In a few weeks the first fruit were obviously starting to develop. Although the planting consisted of a number of different plants of *C. chilensis* I soon found out from the Council concerned that they were planted in one batch and it was highly likely that they were all propagated from the same plant. Their extreme self-sterility being maintained in each cutting had encouraged hybridisation.

Closer investigations of a number plantings of these two introduced species near native vegetation including mainly *C. rossii*, the most common species in South Australia, showed some hybrids in every case. In none of the populations investigated were very many hybrids found but they were usually immediately recognised by their more vigorous growth similar to their introduced parents. As more hybrids were investigated it became more complicated to identify their putative parents unless there were only two species growing

together. The problem is compounded by the fact that the hybrids (presumably F1 hybrids only) of *C. edulis* at least in localities where only it and *C. rossii* occurred, always produced large purple flowers like *C. chilensis*. Usually they had slender outer perianth lobes similar to those the parents and unlike *C. chilensis*.

However, too few plants were investigated to judge whether here too the distinction ultimately becomes blurred. Some cultivated plants were found to be hybrids. Since I have seen similar purple-flowered presumed hybrids with *C. edulis* on photographs from western as well as eastern Australia it seems that the yellow colour of the petaloid staminodes of *C. edulis* is a double recessive character, and similar problems in the recognition of true *C. chilensis* would occur throughout Australia. All hybrids of these two introduced species with native species need to be described in order to understand the species more clearly.

Natural hybrids between native species were also found in South Australia, but are generally restricted to a few plants. A somewhat wider hybrid swarm of *Carpobrotus rossii* and *Sarcocolla praecox* was discovered near Port Augusta, one of the few places where in South Australia arid vegetation comes into contact with the coastal one. The hybrid is, however, restricted to coastal dunes while typical *S. praecox* is found not far to the inland from this locality.

Chinnock (1972; *New Zealand J. Bot.* 10: 615–626) described from New Zealand natural intergeneric hybrids between *Disphyma australe* and *C. edulis* as well as *C. chilensis* (then *C. aequilaterus*). Further experiments showed that *Disphyma*, a tetraploid, will always be the female (Chinnock, pers. comm.) for this sterile triploid hybrid. No such natural hybrids

of native or naturalised *Carpobrotus* species in Australia with the native *Disphyma crassifolium* subsp. *clavellatum* have yet been recorded. A barrier here would be significant in view of the compilation of Hammer & Liede (1990, *S. Afr. J. Bot.* 56: 356–362) of many recorded artificial and natural intergeneric hybrids which was intended among others to show a high degree of self-fertility in the family.

In California the native *C. chilensis* was observed being swamped by an extensive hybrid swarm between it and *C. edulis* (several personal communications). In contrast to the experiment above involving *C. rossii* here both these species are self-sterile so that only hybridisation can occur unless cross-pollination can be encouraged from distant populations, which is, however, much less likely. But once the hybrids are established in an area even such cross-pollination will most likely only perpetuate the problem.

Cross-pollination is enhanced in the Australian species by their generally trioecious nature. Although this has not yet been fully recorded for all the large-flowered species, it seems significant that the few species with very small flowers, like *C. modestus*, *S. bicarinata* and *S. praecox* were always, wherever found in their wide distribution, hermaphrodite and produced few stamens so that one can assume a different floral biology.

Considering that at least *C. edulis* has been recorded as established for more than 150 years in Australia present observations on *Carpobrotus* in Australia do not support alarmist views on the proliferation of hybridisation, and the usefulness of these more vigorous growers, *C. edulis* and *C. chilensis*, in stabilising and revegetating disturbed coastal dunes outweighs occasional hybrids. Both these species are easily established in many parts of Australia but are not known to spread or hybridise aggressively anywhere. Any observations would be appreciated.

Request

Since it is important to recognise the hybrids in order to be able to delimit the species and subsequently monitor their frequency I would be grateful to receive any live material of such cases, particularly from populations with only two species present which reduces the uncertainty about the parents. I would appreciate a branch of all three plants, ideally with some flower buds on them so that I can evaluate the material as it was naturally growing. I shall then cultivate them under near-uniform conditions so as to compare them with other plants already in cultivation. Material of *Carpobrotus* has always travelled well packed in newspaper to absorb excess moisture and placed either first in a plastic bag or directly in a postage bag if dispatched immediately.

THESIS ABSTRACTS

EPACRISCAV. - ITS PHYLOGENY AND RELATIONSHIPS TO RUPICOLA MAIDEN & BETCHE AND BUDAWANGIA TELFORD

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*Abstract of a thesis submitted for Honours for
Graduate Diploma of Biological Science.*

Sequences for the atpB-rbcL spacer region were obtained for 20 species of *Epacris* Cav, as well as *Rupicola sprengiloides* Maiden & Betcher, *R. ciliata* Telford, and *Budawangia gnidioides* (Summerh.) Telford. Cladistic analysis with a range of outgroups drawn from all four tribes sensu Powell *et al.* (1996) and rooted on *Prionotes cerinthoides* (Labill.) R. Br. yielded a relatively robust phylogeny. The topology obtained is consistent with the relationships inferred between the ingroup and the representatives of the outgroups on the basis of rbcL sequence data by Crayn *et al.* (1996). Styphelieae represent a derived lineage which is sister to Epacrideae sensu Crayn *et al.* (in press). Within the last group, *Woollsia* is again shown to have diverged first, followed by *Lysinema* which is sister to the ingroup (*Epacris*, *Budawangia* and *Rupicola*). *Epacris*, *Rupicola* and *Budawangia* form a strongly supported (bootstrap 100%, decay +14, parjack 100%) monophyletic clade, with *Rupicola* and *Budawangia* clustering firmly within *Epacris*. The clade is divided into two well supported

sister clades: Group I, comprising 15 species including both *Budawangia* and *Rupicola* (bootstrap 97%, decay +4, parjack 94%); and Group 2, comprising 9 species (bootstrap 88%, decay +3, parjack 92%).

The analysis clearly demonstrates the paraphyly of *Epacris* as presently circumscribed (Telford 1992; Powell *et al.* 1996). Continued recognition of *Budawangia* and/or *Rupicola* would require the dismemberment of *Epacris* into at least three genera, and more extensive sampling of the genus might increase the number of segregates required. A preliminary morphological data base assembled here indicates that none of these segregates is clearly identifiable on unambiguous morphological synapomorphs. Hence, the most appropriate course is to broaden the circumscription of *Epacris* to include both *Budawangia* and *Rupicola*.

PHYLOGENETIC RELATIONSHIPS WITHIN MONOTOCAR. BR. AND OLIGARRHENA R. BR. (EPACRIDACEAE)

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Abstract of Honours thesis

Monotoca R. Br. is an endemic Australian genus of some 11 described species (plus two others in

preparation: *M. 'aristata'* Powell & Chapman and *M. 'minutifolia'* Albrecht), found in all states but not the Northern Territory.

A recent cladistic analysis based on morphological characters (Powell *et al.* 1997 *Aust. Syst. Bot.* 10: 15-29), suggested *Monotoca* as currently circumscribed is monophyletic only if the monotypic Western Australian endemic *Oligarrhena* R. Br. is included. Relationships among the three species groups (*Monotoca* A, B and C) defined for that analysis were not resolved. We have applied nucleotide sequence data from two plastid regions, *matK* and the *atpB* - *rbcL* spacer to the resolution of relationships among this problematic group. A revised morphological database was also assembled.

Parsimony analyses were conducted on the separate and combined datasets, using both molecular and morphological data, and the robustness of the resulting topology determined by bootstrap and decay analyses. Analysis of the molecular data, using *Prionotes cerinthoides* (Labill.) R. Br. as the outgroup, provides strong evidence for the paraphyly of *Monotoca*. Two robust groups are resolved: the first group (*Monotoca s.s.*) comprises *M. 'aristata'*, *M. elliptica* (Sm.) R. Br., *M. empetrifolia* R. Br., *M. ledifolia* DC., *M. linifolia* (Rodway) Curtis, *M. rotundifolia* Willis and *M. scoparia* (Sm.) R. Br.; the second group (*Oligarrhena* group) comprises *M. tamariscina* F. Muell. and *Oligarrhena*. Another monotypic Western Australian endemic, *Needhamiella* L. Watson, clusters weakly with the latter group. The two groups show no close relationship with each other, being separated by other genera (including, *inter alia*, *Trochocarpa* R. Br. and *Pentachondra* R. Br.) in all analyses. Analyses of the morphological data and a

combined molecular/morphological dataset support this result and associate *M. oligarrhenoides* F. Muell. with the *Oligarrhena* group and *M. glauca* (Labill.) Druce and *M. submutica* (Benth.) Jarman with *Monotoca s.s.* The presence of keeled bracteoles, glabrous corolla tubes, tricolpate monad pollen and unilocular ovaries are the main characters that define *Monotoca s.s.* The analyses indicate the glabrous corolla tubes in the *Oligarrhena* group result from the retention of the plesiomorphic condition, whereas in *Monotoca* they represent a reversal from the hairy condition found in other *Styplelieae*.

Whereas sequence data from the *atpB-rbcL* spacer and *matK* gene are shown to be suitable for determining intergeneric relationships within *Epacridaceae*, there is little support in those data for relationships between species within the two groups resolved in this study. Sequence data from less conserved regions may provide more useful information.

The *atpB-rbcL* spacer and *matK* regions have provided characters which have shed considerable light upon the generic concepts in this previously problematic group. Where previous morphological analyses were unable to resolve relationships, molecular data has identified very robust groups. This demonstrates the usefulness of molecular data to taxonomy.

[Abstracts provided by Darren Crayn, 30 May 1997]

ABRS REPORT



**Australian
Biological
Resources
Study**

PUBLICATIONS

Fungi of Australia Vol. 2A, Catalogue and Bibliography of Australian Macrofungi 1. Basidiomycota p.p., by Tom May & Alec Wood.

Volume 2A was published by ABRS/CSIRO on 23 April 1997. It comprises 348 pages and will be an essential reference for all those working on or interested in Australian macrofungi. It will also have considerable relevance in countries far beyond these shores. For the first time we have a comprehensive census and synonymy for the groups covered, and a meticulously compiled bibliography of the Australian literature tied to these names. The book is available from CSIRO Publishing, PO Box 1139, Collingwood, Vic. 3066 for \$64.95 (hardcover) and \$49.95 (softcover). Prices are in Australian dollars for Australian and New Zealand customers, and US dollars for overseas customers, and include postage (by air overseas). Enquiries can be directed by email to sales@publish.csiro.au.

STAFF

The staff of ABRS Flora Section were very sorry to hear in April that our Director, Dr Gwen Shaughnessy, had decided to take (relatively) early retirement. Her last day was 30 April. Gwen had been with the Section for a little under 2 years, but in that time had endeared herself to the staff with her quiet but firm and level-headed management style. We will miss her. For the next 3 months Mr Ian Cresswell will be Acting Director, while the long term directions of ABRS are reviewed, and strategic plans for the new millenium are put in place.

NEW ABRS E-MAIL ADDRESSES

Ian Cresswell: ian.cresswell@dest.gov.au
Tony Orchard: tony.orchard@dest.gov.au

THE PUBLICATIONS PROGRAM

Many of you will have seen the recent 'consumer survey' of Floras written by Rudolf Schmid (*Taxon* 46 (1): 179-194 (1997)). Here 22 current Floras were examined in detail against an extensive list of desiderata. *Flora of Australia* was one of those surveyed, and received a final ranking 'Amongst the very best'. This welcome ranking reflects the enormous amount of planning that has gone into the series over the years, both by the staff and by the Flora Editorial Committee, as well as the conscientious efforts of the over 150 contributors, and similar number of illustrators, who have so far provided materials for the series, and the efforts of the editors who have

meticulously checked manuscripts and assembled the books. About one third of the *Flora of Australia* is now published, and about half has been written. Australian botanists can be very proud of their Flora, and all would surely want to see it completed as soon as possible. In the last 12 months we have also seen the publication of the first 3 volumes of the parallel series *Fungi of Australia*, an even larger task than the Flora, but one which is attracting very favourable comment and a considerable degree of enthusiastic cooperation.

There are, however, some worrying trends becoming apparent, which could prevent the completion of *Flora of Australia*, or greatly delay it, and these need to be considered carefully by the botanical community. This is after all a national project that requires input from the widest botanical constituency if it is to succeed. So please indulge me while I outline some uncomfortable facts.

It is instructive to stand back a little from the project, and look carefully at its origins. One of the principal driving forces leading to the establishment of ABRS was the oft-repeated call from the botanical community for an up-dated *Flora australiensis*. This call was strongly enunciated by Maiden in 1907, and repeated by many others over the succeeding 60 to 70 years. When ABRS was established in 1979 one of its major planks was the production of a new *Flora of Australia*, based largely on current knowledge. However it was also recognised that 'current knowledge' was very uneven and that for some groups was quite inadequate to produce even a 'status quo' Flora. The Government therefore wisely established a grants scheme that could be used to produce targetted revisions of problem groups. It was

never intended that all Flora treatments would be based on new revisions, as such an undertaking would result in an unacceptably long timeframe for completion of the Flora. The grants scheme, which has evolved into the ABRS Participatory Program, has delivered enormous dividends over the last 20 years, and resulted in a much better state of taxonomic knowledge for Australia's plants and animals than would otherwise have been possible. The *Flora of Australia* is fortunate, in a world context, in having the facility to pay for some of its treatments through its grants and contract systems.

Over its lifetime a large part of the text of the *Flora of Australia* has been donated, with little or no financial outlay from ABRS. Without this generosity on the part of individuals and institutions (particularly from the Directors and staff of the major Australian herbaria) the project would not be as far advanced as it is. In the early days as much as three-quarters of the manuscripts were donated. As the project has proceeded that proportion has decreased, for a number of reasons. The early treatments mined the capital of already (recently) completed monographs, while the later treatments have inevitably contained a higher proportion of 'difficult' groups. In addition, changed economic circumstances have forced more institutions into the situation where cost-recovery has become a major consideration in research planning. Over the years there has also been a subtle change in taxonomic community expectations, with at least some now expecting that all or most *Flora of Australia* treatments will be based on new revisions. This is unrealistic given the financial resources available and the timescale in which the project must be completed. It is also contrary to the founding spirit of the Flora project.

In the last couple of years new complications have arisen. The rate of publication of the Flora has increased, and with it the demand for completion of manuscripts. A large number of volumes are partly written, and I have been trying to concentrate on getting as many of these completed as soon as possible. Multi-author works always pose a problem, where one or two authors fail to meet deadlines, delaying a whole volume in the process. The *Flora of Australia* is no exception. We currently have five volumes almost ready for press, but each held up by non-delivery of manuscripts from one or two authors. In some cases agreed deadlines have been repeatedly missed over several years. This is most unfair on those authors who have delivered on time, and who see their treatments languishing and going out of date. It also causes severe problems for ABRS. Already-edited sections often have to be re-worked to keep them up to date. If the missing sections are the subject of contracts, then budgeted funds are often lost to ABRS at the end of the financial year when manuscripts are not delivered in accordance with contracted obligations. The contractor, however, still expects to be paid in full when the contribution is eventually delivered, and ABRS has to find the money again. This kind of problem has cost us several thousand dollars in the last couple of years, money that could have been more usefully spent on supporting new projects.

At the same time as demand for support of taxonomic work is increasing, ABRS finds its budget rapidly shrinking. The ABRS budget in 1996-97 and in 1997-98 was and will be only a little over half of that available in 1995-96. The Grants program, as the biggest single cost, will suffer the largest decrease in dollar terms. Total grants expenditure on botany in 1996 was \$954,000 whereas in 1997 it will be \$585,000.

The amount available in 1998 is expected to decrease again. The publications program of ABRS is under tight scrutiny to try to identify savings and new directions. One result of this is that the *Fauna of Australia* series will be suspended indefinitely once the current volume (Molluscs) goes to press in the next few weeks. ABRS senior staff are investigating possibilities for joint projects with various arms of the new Natural Heritage Trust (proceeds of Telstra partial sale) program, although ABRS will not be a direct beneficiary of the Trust. Should these approaches be successful, financial support will likely flow to specific contracts, rather than feed back into the grants program.

What does this mean for *Flora of Australia*, *Fungi of Australia*, and associated publications? It seems unlikely that ABRS will be supporting many large, long-running projects through the grants program in the immediate future. Disposition of grant funds is of course at the discretion of the ABRS Advisory Committee, but they will be constrained by the reduced pool of funds available, and by past commitments to on-going projects which will work their way through the system in the next couple of years. The pool of program funds available to support small contracts will also be diminished, and this will impact particularly on small writing contracts and preparation of illustrations. At the same time there is an expectation that publications will continue to appear at a rate at least equal to that in the recent past. This is essential if *Flora of Australia* is not to suffer the same fate as *Fauna of Australia*. Consequently ABRS will have to adopt a stricter regime for contracts. Contractors will be expected to meet reporting deadlines, payments will tend to be on receipt of goods rather than in advance, and payment will not be guaranteed for work

delivered late, especially in those cases where the late delivery involves carry-overs to a new financial year. Of course, we recognise that things can go wrong, and there will be an ability to vary contracts to accommodate this. However, such variations will need to be negotiated well in advance of due dates, not afterwards.

These changes may sound harsh at first glance, but with goodwill on both sides need not be. I intend to do everything possible to maintain the high level of friendly cooperation that currently exists between ABRs and the botanical taxonomic community, as this will be necessary to ensure that the *Flora of Australia*,

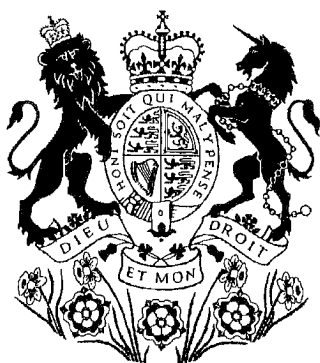
Fungi of Australia and other publications are brought to a successful conclusion. I am determined that *Flora of Australia* will not become just another partly completed Flora on the dustbin of history. My hope is that Australian botanists will agree with this sentiment, and that together we can write and publish the remaining parts in an efficient and timely manner, while moving on to the Fungi (and let's not forget the Algae!).

I hope to present a more cheerful report in the next issue!

Tony Orchard

[Received 30 May 1997]

ABLO REPORT



**Australian
Botanical
Liaison
Officer**

Since my last report the days have lengthened considerably, it has even rained a little bit and we have had temperatures as high as 25° C. However, in the middle of all this we still managed one frosty morning of about minus 5°.

Chelsea Flower Show 20–23 May 1997

I only spent half a day at the Show but this was enough to get a good overall view of this annual highlight of the gardening world. The crowds were reasonable as long as you did not want to stop moving for more than a few minutes. Surprisingly it did not rain, well at least not while I was there.

The Kings Park display attracted a lot of attention and was one of the more spectacular displays under the 'big top'. There will be an added bonus of some plants for Kew. Another Australian highlight was a rather large display promoting the Melbourne International Flower and Garden Show to be staged in the first week of April next year.

The range of plants and display gardens was mind boggling, not the least being a new *Clematis* cultivar ('Clematis Blue Moon') that unfortunately will not be released in Australia for a few years. On the last day of the Show you could pick up bargains such as two giant urns for £40,000 or a fully grown Blue Cedar tree for £1,800. No? Well how about a basket of sweet peas for just £8.

At 14 pounds for a half day ticket I thought it was a bit expensive but thousands flocked to see the Show and all the tickets were sold.

The Great Debate

A debate 'That this house believes that Linnean classification without paraphyletic taxa is nonsensical' held at the Linnean Society, on 6th March 1997, attracted a capacity crowd. The debate resulted in a win for the Kew team consisting of Dick Brummitt and Alan Paton. A lively discussion followed the debate and voting was done with the aid of the traditional Linnean ballot boxes. Keep your eyes open for publication in the Linnean, possibly in the October edition.

Blue Bells

The Blue Bells in the Gardens, particularly around the restored Queen Charlotte's Cottage, put on a really spectacular display for a week or so. Joy and I took advantage of an opportunity to visit a Blue Bell Woodland near Henley-on-Thames. The reserve consisting of 258 acres supports of 450 species of plants including a few rarities.

Disruptions

Window replacement in D wing (which includes the Library) has gone ahead without too much disruption except for an unexpected collapse of some ceiling tiles. However, during September and October the Library and Archives will be

closed for about 5 weeks while the rewiring is done. Various other building works will continue well into 1998 and some areas of the herbarium will be closed. If you are planning a visit in the next 12 to 18 months please let the Keeper know.

Retirement?

Thursday 22nd of May saw a wonderful spread of food and drink to celebrate the retirement of Senior Messenger Brad. The previous day was Dick Brummitts last day on full salary but fortunately for the world of Botany he was back the next day wondering which half of the day to work. I have been trying to persuade Dick that his many friends in Australia would like to see him.

The Millennium Seed Bank

The appeal for the Millennium Seed Bank recently received a boost with a grant of 9.2 million pounds from the Wellcome Trust. The Trust is particularly keen to see plants of medicinal value saved at the Seed Bank. Work on the Seed Bank is due to start later this year at Wakehurst Place.

The Eden Project

Plans for a series of huge biodomes to be built in a disused clay pit in Cornwall recently appeared in the press. Stretching for a kilometre and rising to 60 metres the project is expected to cost 106 million pounds. It is suggested that over 10,000 species of plants will be housed in the biodomes when completed.

Robert Brown Slips

Housed at the Natural History Museum are Robert Brown's collecting slips which can often provide information, particularly about the locality, that is not given on the specimen labels. I have recently spent some time going through some of the boxes and was

disappointed to see many of slips, all of which are numbered, out of order. Stopping to put the slips back in the correct order made my job that bit harder.

CGE

If you have requested loans from CGE and have not had response please let me know. They are unable to process loans but it is possible to go to Cambridge and photograph the material.

New York

No I am not going to New York but Ken Hill (NSW) is. If you have any requests from this institution let Ken know as soon as possible (before the end of June).

Visitors

There has been a continuing influx of Australian visitors with Linda Broadhurst, Mark Clements, Karen Wilson and Betsy Jackes all

using the Kew facilities in recent times.

Adelaide Conference

A small group from Kew will be coming to the Adelaide Conference and hopefully HISCOM as well. This will be a great opportunity to exchange ideas and for Kew staff to see what has already been achieved in Australian Herbaria.

Don Foreman

[Received 30 May 1997]

As an addition to the above Don faxed (on 30 May) the following note from the then current Kew staff newsletter: 'Dr Brummitt has left for California to represent Kew at an IOPI/SPP meeting. He will also do some field work on Calystegia. Dick will be returning towards the end of June to start a new contract as a re-employed officer. He will work on SPP and manage the bibliographic research group.'

NEWS FROM FASTS

APRIL CIRCULAR

1. FASTS goes West!

The FASTS submission to the West Review of Higher Education has called on Government and universities to work together to create an efficient, competitive, well-equipped university sector.

The increase in the student numbers combined with a decrease in the funding per effective full-time student has put enormous strains on

university budgets. Current realities are that not all 37 universities in Australia can offer top-level scientific and technological facilities in education and research in all disciplines. Reorganisation of the higher education sector is required - and the rearrangements will not be minor. FASTS investigated and considered the consequences of three alternative courses of action in our submission:

- a. closing some universities
- b. refocussing the universities within a regional

area to eliminate course duplications
c. concentrating infrastructure support on the highest-performing departments.

We also urged further support for infrastructure - libraries, labs, buildings and equipment - to accompany the process of reorganisation; and pointed out that it is almost impossible for university graduates to meet industry expectations unless the university equipment they use matches industry standards. Many university laboratories no longer meet basic occupational health and safety requirements, and are increasingly operating on outdated and failing equipment.

I have to thank Dr Chris Easton for his sterling work in drawing the submission together. A full copy is available on our web site.

2. The Budget

The Budget is being handed down on Tuesday May 13. Peter McGauran has again invited me to view the Budget from his office, and to discuss SET matters with him. I am not expecting any dramatic news as far as S&T is concerned, although there have been disturbing rumours about cuts to the CRC program.

We will pay particular attention to the five matters raised in our pre-Budget submission:

- a. the impending shortage of qualified mathematics and science teachers.
- b. creating a national vision for Australia which develops specific aims for S&T
- c. the restoration of the 150% tax deductibility for industrial R&D.
- d. access to high-quality science education and

research at Australian universities.

- e. a whole-of-Government approach to Australia's Ocean Territory

3. FASTS in science policy

Minister McGauran has continued to express appreciation for the role FASTS plays in policy formulation. In a recent letter, he said he had instructed his Departmental officers to seek our advice on international scientific collaboration. He has also invited me to discuss with Chief Scientist John Stocker Victorian initiatives to set priorities for S&T, which were views I initially raised with the Minister.

The role of FASTS in policy areas was the subject of a television interview which Lesley Warner of UCQ recorded with me for the Open Learning Program. It turned out to be a good discussion of FASTS' role in policy, and Member Societies might find it useful to show to their meetings. Copies can be borrowed from the FASTS' office.

4. The WISSET Report

WISSET made recommendations about boosting the participation of Women in Science, Engineering and Technology (WISSET). It was completed in May 1995, and has since disappeared into a black hole. The Labor Government failed to respond in its final months of office (although the Report was commissioned by one of its Ministers). The new Government has declined to make a formal response to what it sees as a Labor initiative, so even though the Report has been dubbed 'a valuable analysis' it still lies dormant. We are urging the Government to take a more active interest in its findings. Australia suffers because the whole area of SET 'expresses a strong sense of masculine ownership' (WISSET p. 3), to the

extent that only 6.9% of staff in engineering and processing in higher education institutions are women.

5. Affiliate members

A number of groups have been invited to become non-voting Affiliate Members of FASTS, at the discretion of the Board. They all have an interest in S&T policy and share the broad aims of FASTS but do not fit the narrow definition of a professional or learned society as set out in the FASTS' Constitution. I believe that the support of these groups will bolster FASTS' capacity to represent the broad interests of S&T groups to Government in Australia. Government prefers to deal with large representative groups which cover the broad sweep of interests of that sector, rather than smaller bodies with strong sectional interests.

6. The Stocker Inquiry

The submission and discussion rounds are almost complete, and the final report is expected about June 22. I expect that among other issues the inquiry will comment on the way in which priorities are set in different portfolios dependent on a S&T information base, and on the advisory processes within and to Government.

7. Senate inquiry into Commonwealth powers in environment

The Senate has initiated an inquiry into Commonwealth powers in environmental protection and ecologically-sustainable development in Australia, to be chaired by SA Democrat Senator Meg Lees. An information pack on how to make a submission and the terms of reference are available from Committee Secretary Robert King on (06) 277 3525. The closing date for submissions is Friday June 20.

8. John Bell

John Bell, former Deputy Secretary of DIST, has resigned to take up a position as Managing Director of ANUTech at ANU in Canberra from May 19. He has been one of FASTS' strongest allies and supporters, and his resignation places added pressure on the Chief Scientist and his staff in DIST.

9. The newImages Conference

I participated in this Anglo-Australian Conference in Sydney. It compared the roles of the Chief Scientists of the two countries. In the UK the position is supported by 100 staff, but one wonders whether a cost-benefit analysis would show the advisory function there has been any more effective than in Australia. Likely outcomes include additional exchanges for young scientists, and a cooperative approach to science festivals of each country. But it is clear that the UK has a definite role in the European Union and Australia a growing role in Pacific Rim SET alliances.

10. Media

President-elect Peter Cullen and I had lunch with the Editor and Science Writer of the Canberra Times, to discuss increasing coverage of SET. We were advised to maintain regular contact (not only when we need them!), and make our stories locally relevant. I still look to every regional newspaper in Australia having regular weekly S&T sections, as the Canberra Times does. Toss Gascoigne is a valuable mentor in this area.

FASTS' media coverage this month included: 'Forum tackles science career issues' (*R&D News*); 'Tips for media-shy scientists' (*Australian*); 'Nation's scientists start lobbying to discover wider power base' (*Canberra Times*); 'Group to start sciences push' (*West Australian*);

'Bleak prospects for young scientists' (*Search*); 'Suspicion of media remains an issue' (*New Scientist*); 'Geologists' PhD dearth' (*Fin Review*); 'An end to the shrink-wrapped career' (*ANU Reporter*); 'Raw deal' for young scientists' (*Search*); 'Call for national science body' (*Australian*)

A reminder that the excellent talks at the National Press Club by Ian Lowe and Peter Doherty are available from Media Monitors. Video tapes \$40, audio tapes \$26, transcripts \$50. Ph (06) 239 5233, or fax (06) 239 5244. Both speeches are also on the FASTS' web site (free!)

Joe Baker
7 May 1997

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WHY SCIENTISTS SHOULD COMMUNICATE

[Written by T. Gascoigne for Australian
Microbiology Newsletter]

In the May issue of *Microbiology Australia*,

John Finlay-Jones outlined some of the challenges facing scientists in the media. He used the recent rash of food-borne pathogens to illustrate the difficulties of gaining accurate coverage for complex issues.

The media can be tricky, but favourable media coverage encourages a range of positive outcomes: create jobs, improve public health, increase funding for research programs, change policy, and satisfy public curiosity. And as most of the funding for research in Australia is provided from the public purse, scientists have a duty of accountability to explain how public funds are being spent and what the benefits are. The future for groups which depend on public funding and do not have community support is bleak. Microbiologists make a major contribution to the wealth and health of society, but is this contribution properly recognised? Do people understand what microbiologists do? The industries they sustain? Do they accept the need for continuing funding of microbiological research?

Julian Cribb, former science writer for *The Australian* newspaper, claimed that scientists had let Australia down because they have not told the people what they are doing: 'Scientists have been so wrapped up in their work and their discoveries, they have forgotten to explain them to the society that pays their miserable wages. They have omitted to put their work in language that ordinary people can understand. They have failed to explain its relevance to our daily lives - our health, wealth and well being as a nation - and how to put it into practice in our industries.' He was a great advocate of using the media as a tool in building support, a proposition that scientists sometimes find difficult. Scientists and journalists tend to eye each other suspiciously from great distances.

But some scientists have learned to use the media with great skill (and profit). To help those just starting out, here are five tips for basic survival:

1. Get your message straight. Work out the two or three main points you want to get across, phrase them in simple non-technical language, and stick to these points. There is no time or space for complicated explanations.
2. Talk about the implications of your work, rather than the clever science. People want to know how they are going to be affected by your work. Is it going to mean cheaper bread? Will it expose some dangerous food-handling practices? Will it create a new export industry?
3. Learn about the world of the journalist. They live by ferocious deadlines, and are always in a hurry. They work in a highly competitive industry, and few understand even basic scientific facts. But they do try to get things right - the onus is on you to explain your work in clear and simple terms.
4. Prepare a single sheet of paper with the important details. This should set out the basic details of the story, spell everyone's names correctly, and have your phone contact points. And consult your collaborators and colleagues to make sure everyone agrees on the wording - it can head off territorial arguments before they start.
5. Understand the importance of pictures. Good pictures can make all the difference. A compelling photo can gain a story prominent newspaper coverage; and the rule is that without interesting pictures, there is no television story.

Show enthusiasm for your story; don't wear sunglasses on TV (you'll look like a crook); be available to journalists; always look at the reporter on TV and NEVER look down the camera lens; and be conscious of reporters' deadlines.

There is a lot scientists can learn in making the media work to their advantage. Unless they learn to use the media to explain their work to the public, they cannot hope that the public will support them. Lack of public support translates rapidly into loss of public funding, and the sidelining of what should be one of the driving forces of Australian life.

AWARDS

Congratulations to a long time member and supporter of the ASBS, Mrs **Enid Robertson**, on being made a Member in the Order of Australia in the latest Queen's Birthday Honours list. Enid's award was for services to botany, conservation and native vegetation management.

PLANT NOTES

PANICUM RACEMOSUM

In August 1993, during a coastal reconnaissance in the Newcastle area, a stretch of foredune at Stockton was found to be covered by a grass that, on first sight, looked very similar to *Spinifex sericeus* (PCH 93019, CANB 465866). It had the same, somewhat clumped growth habit resulting from shoots forming at runner nodes, and its long runners extended downslope onto the upper beach. However, it lacked the dense pubescence of *S. sericeus*. No fertile material was present, but colleagues found some shoots in fruit five months later (PCH 93019A, CANB 465883). These were identified as *Panicum racemosum* (P. Beauv.) Spreng., a foredune grass from South America. Identification was kindly confirmed by S. A. Renvoize (K) and F. O. Zuloaga (SI). In Australia, this species has also been found near Geelong, where it 'has persisted for some years as a troublesome weed around grain storage areas, but does not appear to have become naturalized elsewhere' (Walsh 1994, p.p. 585–586).

P. racemosum is widespread along the shores of the Atlantic Ocean from about 11° S (Renvoize 1984) to about 38° S (Pfadenhauer 1993). Renvoize also reports it to occur in Chile. At least in the southern half of its range along the Atlantic Ocean *P. racemosum* is a dominant element of the foredune vegetation (Cordazzo and Seeliger 1993, Eskuche 1973, Pfadenhauer 1993; Eskuche's figure on p. 211 shows how similar the growth habit of *P. racemosum* is to that of *S. sericeus*).

In the late 1980s the dunes at Stockton have been rehabilitated by the Newcastle City Council. Trenches were dug to bury the prolific stands of *Chrysanthemoides monilifera*, while *Ammophila arenaria* was planted to stabilize

the sand. This was followed with planting of *Acacia sophorae* and *Banksia integrifolia* (D. Conway, P. Moffett, pers. comms.). Conway also remarked that *P. racemosum* was locally known as another kind of 'marram', that it had spread from the football oval situated near the northern end of the reclaimed area, and that it may have been used in combination with marram. However, no explanation could be given for when and how it had arrived in the area in the first place. As at Geelong, *P. racemosum* does not appear to have spread much beyond the reclaimed dune area. Sparse flowering, i.e. limited propagule production, could be one reason for this. However, far from being a troublesome weed, it fulfills an important role as dune stabilizer.

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[Provided by Marco Duretto, 19 May 1997]

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AN EDITORIAL COMMENT—2 A TENSE SITUATION

This issue's comment is on the tense used when referring to a published work or worker. When quoting or discussing what a previous author has written, some writers use the present tense, some the past; likewise when referring to the work or publication itself. Some mix their tenses without apparent consideration or understanding of which is correct.

It seems that, grammatically, the past tense should be preferred when the intent is to state what a writer wrote or did. After all, the work was done and the text written in the past; moreover, the writer, or her/his opinion, may no longer be extant. For example: in *Flora Australiensis*, Bentham described 8125 species of plants; or: George, in *Nuytsia* 3: 430 (1981), considered it 'not practical to formally divide [*Banksia leptophylla*] into infraspecific taxa'. On the other hand, the publication itself remains a current resource. When we refer to it (as though holding it up), we should say: *Flora Australiensis* describes 8125 species of plants;

or: Volume 35 of the *Flora of Australia* places *Brunonia* in its own family.

There may be the occasional situation when it is appropriate to depart from this, for a particular effect, but in most cases following the above practice would improve the standard of our writing.

Alex George, 'Four Gables',
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I REALLY DO WISH TO THANK

Philip Short raised the issue of overly wordy acknowledgements in the last issues of the ASBS newsletter, and while I don't want to blow the issue out of proportion, I can't resist commenting. Acknowledgements are often the only place where people who do a lot of the work get recognition. Sometimes it is essential to acknowledge places or people even if they

haven't done a very good job and thanks here can be hypocritical. However, when people do a good job they deserve acknowledgement for it and the word 'thanks' can convey a lot. Thus while I don't personally care whether you 'wish to thank' rather than just 'thank' (there are probably better ways to shorten most manuscripts), I disagree with Phil about deleting thanks altogether. Small words can matter a lot. If someone has done a good job for you, thank them for it. Doing science doesn't excuse you from adopting common courtesy.

Bob Hill

University of Tasmania

I quite agree with Bob. I did state that 'it may be a bit blunt' to delete 'I thank'. The issue was the superfluous 'wish to' (P.S.S.).

'SOCIETY OF AUSTRALIAN SYSTEMATIC BIOLOGISTS' WORLD WIDE WEB HOME PAGE

At a meeting on the 4th October 1996 at the University of Melbourne, in conjunction with the 'Beyond the Floras' Conference organised by the Australian Systematic Botany Society, it was decided to form a new society with the aim of representing all systematic and evolutionary biologists in Australia. This society currently has the working title 'Society of Australian Systematic Biologists', although the name of the Society is to be formally decided after the General Meeting in Adelaide (in conjunction with the joint conference). Currently, the only really visible product of this new Society is the World Wide Web Home Pages, although a membership drive is underway and organization for the General Meeting is well advanced.

The Home Pages can be accessed at:- <http://www.science.uts.edu.au/sasb/>

The Pages currently have content under the following headings:

Introducing the SASB

About the SASB

Officers

Membership Details

SASB Documents

Letters

Book Reviews

Invited Contributions

Conferences

SASB Conferences

Other Conferences

Systematics Internet Resources

Electronic Discussion

Internet Links

The Introducing the SASB pages will be updated after the General Meeting in Adelaide, when the name of the Society will be formally decided on, and there will be a formal Executive (rather than the current Organizing Group). Any prospective new members can be directed to these pages for information on how to join the Society.

One of the objectives of the Society is intended to be the lobbying of government agencies and granting agencies; and the results of these activities will be available via the Letters page (there is one pair of letters there, at the moment).

The Book Reviews section contains a number of reviews, of some of the currently-available texts in systematics; currently these are modified versions of reviews that originally appeared in the ASBS Newsletter. The reviews are designed to be comprehensive, rather than

the usual 500-word jobs that are usually available in the printed literature; and, of course, the reviews should appear ahead of the often lengthy delays that can happen with printed-journal reviews. In the future, the reviews will be expanded further into areas such as computer programs (MacClade is the only program covered, so far).

The first part of the Invited Contributions concerns introductory material for phylogenetic analysis. Some of the contributions are already available, with more in preparation. Other Contributions are being planned, as ideally this section should be dominated by timely reviews of topics important to systematics, as well as the introductory/background material.

The Conferences pages are intended to include a comprehensive list of upcoming systematics-related conferences, both local and international, with Internet links to the appropriate home pages (including those for the next International Botanical Congress).

If the Internet Links section succeeds, then it should be the first port-of-call for people searching for systematics-related information on the World Wide Web. There are currently lists of links in the following sections:

General Sources of Information
Australian Biological Societies and
Organizations
Overseas Systematics Societies and
Organizations
Australian Herbaria and Botanic Gardens
Australian Museums
Australian Universities
Australian Government Departments
Databases

Computer Software
Journals
Miscellaneous Resources

If you can't access the information you need directly from this page, then the first section should provide a pointer to where the information can be found (if it exists, of course). I certainly learnt a hell of a lot about the Internet while compiling this list.

Finally, the Electronic Discussion section is currently in preparation. When it is operational it will allow members to post electronic messages to all other members.

I spent a lot of time reading up about home pages, and looking at other societies' home pages, while preparing the SASB Home Pages. I'm not yet sure whether maintaining these Pages will turn out to be more work or less work than editing the ASBS Newsletter.

David Morrison

University of Technology, Sydney

[Received 27 May 1997]

BOOK REVIEWS

Historical biogeography of the southeast Asian genus *Spatholobus* (Legum.-Papilionoideae) and its allies. J. W. A. Ridder-Numan. *Blumea Supplement 10*. Published by Rijksherbarium / Hortus Botanicus, Leiden, Netherlands, 1996.

The Rijksherbarium in Leiden is justly famous for its longstanding programme of high quality research on the flora of Malesia (the southeast Asian mainland and the archipelagos stretching from there to New Guinea). Major outcomes are *Flora Malesiana* and its companion journal *Blumea*, in which is published the paper reviewed here. This research is impressive in its breadth and depth. It integrates floristics, monographic revisions, phylogenetics, comparative biology and biogeography. It is systematics in the broadest sense. Thus it is not suprising that Leiden has produced leading theoreticians such as van Steenis, Zandee, Roos, Geesink, Kornet and Turner.

Leiden has also produced more than its share of biogeographers. They would have been inspired in part by C.G.G.J. van Steenis, who produced major papers in the 1960s and '70s on the phytogeography of Malesia and the Pacific. His collaborator M.M.J. van Balgooy, who is still active, followed with a series of books on plant patterns in the Pacific. In the last decade a series of workers have produced dissertations integrating phylogeny and biogeography of Malesian plant groups. A nice example is an analysis of the western Pacific flora and its origins by three of these authors (Van Balgooy *et al.* 1996). The present paper continues this tradition.

Malesia is a special place in the history of biogeography, for this is where Alfred Russel Wallace spent the most productive years of his working life (van Oosterzee 1997). Here he independently discovered the theory of evolution by natural selection. Not only this - he also founded the modern science of biogeography and identified one of the most important biotic boundaries in the world. Today this line carries his name, and we now know that it results from a monumental collision between chunks of the long-separated supercontinents Gondwana and Laurasia, reuniting their biotas. However, we are far from understanding fully the complexities of this region's history, as the present paper shows.

This paper by Jeanette Ridder Numan is a beautiful example of the legacy of Wallace and van Steenis, for it is a study integrating evolution, biogeography and geology. It contains the greater part of her Ph.D. thesis, which by Dutch convention was itself published, but in a limited edition (Ridder-Numan 1996). Only the chapter on pollen morphology has been omitted from the *Blumea* paper, and has been submitted to the *Review of Palynology and Paleobotany*. Initially Ridder-Numan's study was supervised by Rob Geesink, and it further develops his work on the primitive legume tribe Millettieae. Sadly and prematurely the supervisor died before the student completed her thesis.

The paper is divided into three parts: a cladistic analysis of *Spatholobus* and allied genera, a review of the geological history of the Malesian region, and a biogeographic analysis that

integrates the previous two parts. It is thorough, meticulous and very detailed throughout. The methods used are by and large sound and up to date, however this is an empirical study. For explanation and discussion of theory and methods, other works are referred to, such as Turner (1995). (Hubert Turner's thesis is an excellent example of the recent theoretical contributions from Leiden.)

Appropriately, the phylogenetic analysis in part one of this work is based on a monograph of the study group, completed some years earlier by the same author (Ridder-Numan and Wiriadinata 1985). The study group consists of all the species in three genera: *Spatholobus* (29 spp.), *Butea* and *Meizotropis* (2 spp. each). From earlier cladistic analyses, these are known to comprise a monophyletic group, and the closely related genus *Kunstleria* is used as the outgroup. A thorough knowledge of the group is revealed by the large set of morphological (80), anatomical (10) and pollen (7) characters used. A good rule of thumb is that one needs at least twice as many characters as terminals in a cladistic analysis, and this data set is well above that limit. Thirty five pages, several excellent line drawings and some large tables and graphs are devoted to a detailed discussion of the 97 characters. This section epitomises the thoroughness of the study and is recommended as a model for similar studies. My only quibble is with the discussion of the nine quantitative characters. Several of these are graphed, clearly showing the continuous nature of the variation, yet there is no discussion of how the states are defined. A substantial literature on the problems of 'gap-coding' continuous characters is overlooked (Gift and Stevens 1997 and references therein).

The cladistic analysis itself is a standard

parsimony analysis using PAUP. Encouragingly for such a large data set, only three parsimonious trees were found, with minor differences due to uncertain placement of a couple of species. All three ingroup genera are shown to be monophyletic. One of the three trees is chosen as 'best', based partly on a character weighting procedure proposed by Turner (1995), and partly on intuition. The tree is evaluated in detail in terms of the support of branches by the characters. Again I quibble because none of the widely used tests of phylogenetic robustness are employed here (*e.g.* Bremer support, T-PTP tests or the Felsenstein bootstrap), even though some of them are available in PAUP. However, the dynamic character-weighting cum tree-searching procedure of Goloboff (implemented in his program Pee-Wee) is tried, but the resulting trees are intuitively unsatisfying - they do not even show the genera to be monophyletic.

Part two of the paper is a review of the geological history of the region in which the study group occurs. This comprises the Indian subcontinent and west Malesia (excluding New Guinea). A very large amount of literature is cited, and this review would be a useful reference for anybody interested in the biogeography of this region. It is supported by an excellent series of detailed maps, showing plate boundaries, subduction zones, sea levels and terranes at various time slices from the Palaeozoic to the present. It is not light reading, for this region must have one of the most complex geological histories in the world. It is thought to have accreted from many small terranes, most of which rifted north from Gondwana over a very long period, commencing in the Palaeozoic or perhaps even earlier. Of course, major impacts on the region have been caused by the collision of first India

and then Australia. Even today it is a highly active zone, as frequent reports of earthquakes and volcanic eruptions testify. Figure 3.17, mapping only the Philippine-Moluccan region, shows eleven currently active subduction zones!

Part three (historical biogeography) is the main guts of the paper. Here an attempt is made to explain the origin, spread, fragmentation and diversification of the study group by reconciling its phylogeny and distribution with the geological history. This section has two parts: (I) a component analysis of several taxa including the present study group, with the aim of deriving a general area-cladogram that shows the history of vicariance events in the study area; and (ii) a reconciliation of the *Spatholobus* group with both the general area-cladogram and the map to elucidate the unique history of this group.

Like the first two parts of the study, this analysis is thorough and rigorous. The critical first step of defining areas for analysis is discussed in detail, with citation of some but not all of the relevant literature. The standard problems, such as empty areas and areas containing widespread species, are canvassed. It is stated that delimitation of areas is based on distributional discontinuities but the method seems subjective or at least unclear (this is no different from most studies). However, it is noted that many (but not all) the areas correspond with geological units described in the previous section.

Several methods are available for deriving general area cladograms, all are flawed and vigorous debate continues about them. Ridder-Numan chooses Brooks parsimony analysis (BPA), which is in widespread use, and component compatibility analysis (CCA),

whose use is largely restricted to the Leiden school. With both these she uses two different rules ('assumptions' 0 and 1) for dealing with the confounding effects of widespread distributions and missing data. Phylogenies input for analysis are not only the *Spatholobus* group but additionally some from distantly related taxa, with the aim of finding a more general area-cladogram - one that reflects a history of externally imposed vicariance, rather than one-off dispersal events that only affected the history of *Spatholobus*. The results of the four different analyses have some area-clades in common and some differences. None is completely resolved. Again using largely subjective reasons, she prefers one of these (that from BPA with assumption '0').

I would not dare to report here in all its complexity the general area-cladogram preferred by Ridder-Numann. It shows an early history of vicariance events in what is now mainland Asia, and later ones among the islands. She attempts to reconcile this with the geological history, which is a brave act, given the complexity of the latter. More interesting perhaps is her final section, a reconciliation of the *Spatholobus* cladogram with both the general area-cladogram and the geological history. Again these are too complex to report here. Of course, this section is highly speculative, but was probably fun to do. Briefly, she hypothesizes the origin of the group (and of all three genera) in the early Tertiary of mainland Asia, perhaps before the impact of India. From there *Spatholobus* migrated to the islands of Malesia in a series of episodes mediated by rifting, lower sea levels and corridors of suitable vegetation, and differentiated gradually into the extant species. The lineage even appears to have migrated back to mainland Asia (e.g. Indochina), and

differentiated further there.

It would be difficult to test such a detailed scenario. One way would be to use a molecular clock to date the nodes on the cladogram, and to test these against the dates of the matched vicariance events. Ridder-Numan is careful to avoid hypothesizing anachronistic events. For example she notes (p. 128) that the area patterns shown by her taxa do not reflect the pre-angiosperm (Triassic) collision of Sibumasu with Indochina / East Malaya, whereas geological entities within Borneo, which assembled during the Tertiary, are evident in the distributions of her species. (Sibumasu is an ancient fragment of north Gondwana that today comprises parts of east Burma, west Thailand, west Malaya and west Sumatra.)

A cynic might dismiss the final scenario thus. The geological history of the southeast Asian region, comprising numerous plate splits and collisions, climatic changes and sea-level fluctuations, is incredibly complex. Therefore it would be possible to construct a plausible scenario of vicariance and dispersal events to fit any taxon's phylogeny and distributional pattern. However, I am not a cynic. We now know far more about the history of Malesia than Wallace did, and as more taxa are studied with the rigour of Ridder-Numan and her colleagues, the many pieces of this gigantic mobile jigsaw will gradually be put into place.

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[Received 10 June 1997]

The ecology and biogeography of *Nothofagus* forests. Edited by Veblen T. T., Hill, R. S. & Read, J. Published by Yale University Press, Yale. (1996), pp. 403.

This splendid book opens with the words 'The unifying theme of this book is its focus on change in Southern Hemisphere *Nothofagus* forests'. Not only does this book achieve the

task of portraying the changing *Nothofagus* forests through time and space, but it also unveils the changing hypotheses and perceptions that historically scientists working on *Nothofagus* have held. *Nothofagus* is so often used as the key Gondwanan link in biogeographical studies, yet discussions of long distance dispersal in the family are now eroding away the almost mythical status that these plants once held. This is not to say that this family is no longer a critical player in the biogeography game, in fact this book elegantly and in minute detail, demonstrates that the importance of the genus goes beyond only this notoriety.

Almost everything that is currently known about southern *Nothofagus* forests, both past and present has been said in this book. The 403 pages are a testament to the interest that this genus has created. This book really is a one stop shopping place for scholars of *Nothofagus* and southern forests. One of the extremely appealing aspects of this book is its integration of an ecological and historical perspective on southern vegetation change. The introductory and concluding chapters are inspired lessons, setting a standard for others on how to portray to the reader, the possibilities that integration of concepts and themes can achieve. For me they are the icing on this rich cake; definite reading material for the novice and professional alike.

The introductory chapter covers themes such as: temporal and spatial scales of vegetation dynamics, paradigm shifts in successional theory, disturbance and the patch dynamics perspective, microscale climatic variability and vegetation change, macro- and megascale vegetation change (including climate change, photoperiod, carbon dioxide levels and changes

in landmass position) and biodiversity and conservation. Chapter 2 sets the evolutionary perspective discussing current beliefs on the origin and diversification of the genus. The authors comment that the argument for the recognition of Nothofagaceae rests heavily on the difference between the origin of *Nothofagus* cupules and those of other fagaceous genera (Nixon 1989), but that the most recent infrageneric classification (Hill & Read 1991) now rationalises the formal taxonomic division of *Nothofagus* with well established, but recently revised pollen groupings (Dettmann *et al.* 1990). Possible centres of origin predict either the southern South America-Antarctic Peninsula region or the Southeast Asian-Australian region, with the first currently being the more supported hypothesis. The early diversification and migration discussion is very interesting, highlighting the point that fossil *Nothofagus* pollen is so abundant and well known that its absence from Africa and India is one of the few cases in which 'negative evidence' in the fossil record is of major importance.

Of all the detailed information this book provides one of the most stimulating paragraphs that the book provides is to be found on page 17. 'One of the important features of *Nothofagus* to biogeographers is its extremely poor fruit dispersal (Rodway 1914, Preest 1963), suggesting that land-based dispersal was the only option for the genus. Recent pollen evidence (Macphail *et al.* 1994) strongly suggests that rare long distance gene flow has occurred over the Tasman Sea from Australia to New Zealand during the Cenozoic ... Independent evidence from nucleotide differences between the closely related *N. moorei* (Australia) and *N. menziesii* (New Zealand) supports speciation, substantially

postdating the separation of the two landmasses (Martin and Dowd 1988) and the cladistic analysis shown is also consistent with this hypothesis. If long-distance dispersal of *Nothofagus*, either by fruit dispersal or perhaps by live whole trees or parts of trees that floated between landmasses and established vegetatively, was a repeated (if rare) phenomenon, a major reinterpretation of *Nothofagus* biogeography will be required.' Now if that isn't putting a fly in the supporters of vicariance, land-based dispersal ointment I don't know what is. The long distance dispersal banner is flown high in several chapters and for me is one of the most thought provoking ideas to come from the book, but it is only one of many. There is so much detail about *Nothofagus* written on the pages of this book, its a pity that the font size is just a tad small, because its the sort of book you find hard to put down. The buff coloured paper is a nice touch though and the figures and tables are clear and very well presented and the headings are pertinent and informative. If you hunger for detail, this book will satiate your appetite.

Chapter 3 discusses the ecology of New Zealand *Nothofagus* forests, covering topics such as New Zealand geography, the taxonomy of the four species and their geographical distribution, the distribution of these species along environmental gradients, comparative life histories, disturbance regimes in beech forest areas, forest associations, productivity and nutrient cycling, associated biota and the trophic web and beech forest management. Chapter 4 leads the reader through the history and palaeoecology of New Zealand *Nothofagus* forests, discussing the fossil taxa, pollen dispersal, Cretaceous, Tertiary and Quaternary history, the controversial *Nothofagus* gaps and

postglacial spread, and the effects of fire and volcanism. Again evidence is presented which suggests that *Nothofagus* has crossed substantial ocean gaps at times in the past. McGlone, Mildenhall and Pole so rightly point out that there are probably many other species with impeccable Gondwanic inheritance, which have undergone long distance dispersal, particularly to New Zealand and why should so much emphasis be placed just one attribute, presumed poor seed dispersal. Indeed the 'experiments' that created the legend, by today's standards, don't hold water, so to speak.

The ecology of Australian *Nothofagus* forests is well documented by Read and Brown, discussing habit and distribution of the three species, the determinants of cool temperate rain forest boundaries and distribution, phenology and reproductive biology, physiological ecology, regeneration and population dynamics, biodiversity of Australian *Nothofagus* forests, conservation and utilisation. Hill, Jordan and Macphail write an excellent chapter on the history and palaeoecology of Australian *Nothofagus* forests, reflecting on the role of *Nothofagus* in the past Australian vegetation, dispersal again supporting the long distance dispersal debate, finding there is no consistent pattern to the time of first appearance in New Zealand, data which clearly suggests an important role for long distance dispersal from Australia to New Zealand. They discuss evolutionary trends amongst the beautifully preserved and illustrated macrofossils, which includes leaves, cupules and fruits.

The next four chapters described elements of the ecology and history of the other three regions of high *Nothofagus* diversity; New

Guinea and New Caledonia and South America, comprising Central Chile, Southern Chile and Argentina. The fascinating past and present story of the fourteen species which occupy the New Guinea highlands and the five different low altitude New Caledonian species is well documented in Chapters 7 and 8. Read and Hope suggest that the gradient in latitudinal occurrence of this group of plants, provides 'natural experiments' that may provide insights into adaptation of morphology and ecophysiology to climate and soil, as well as differences in community structure and species richness. They suggest that *Nothofagus* is therefore a key taxon, not only in its contribution to studies of palaeoecology and biogeography, but also in its potential contribution to studies in ecophysiology and ecology. The integration of knowledge acquired from all four of these aspects is surely an example which should be attempted for other plant groups too.

History and palaeoecology of the South American *Nothofagus* forests is described in Chapter 11. Nine fossil *Nothofagus* plant associations are distinguished in southern south America from the Cretaceous through to the late Tertiary. These nine groups are then placed into four major groups: the Cretaceous, mixed flora, subantarctic and open forest groups, of which the temporal sequence appears to coincide with major periods of environmental change. An interesting comment appears on page 376, that these ecosystems were probably not affected by major changes in photoperiod and thus may be considered as a reference point for other Gondwana land areas. As we delve into the climate change debate, knowledge of the possible affects of changes in photoperiodicity on a megascale may indeed require further

investigation.

Finally the last chapter attempts to reaffirm the role of *Nothofagus* as a 'key genus' (van Steenis 1971) for understanding the biogeography and ecology of the Southern Hemisphere. The arguments are well supported and there are many very pertinent issues raised. I believe that the whole book sells the message of the importance of the past and present southern *Nothofagus* forests and promotes thoughts for future research and inquiry. All of the contributors are to be congratulated, as are the editors for the excellent task they have done. The Ecology and biogeography of *Nothofagus* forests belongs on the shelf of every student of *Nothofagus*, southern forests, biogeography and evolution. One of my concluding thoughts as I was finishing the book was, how will the next version of such a work portray the southern forests. Even since the publication of this book deciduous Mid Eocene *Nothofagus* leaves have been described from Western and South Australia (Scriven *et al.* 1995) and the relationships between climate change and *Nothofagus* evolution in Tasmania has been discussed (Scriven & Hill, 1996). There is an every increasing pool of knowledge forming with respect to *Nothofagus*. How will our perceptions of the key genus *Nothofagus* change in the future?

Leonie J. Scriven

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Cottoning On. Siobhan McHugh. Published by Hale & Ironmonger, Sydney, New South Wales. 1996. RRP \$29.95.

This book is not about taxonomic botany. It does not even give the botanical name of cotton, or of cultivars, or how to grow them. It is a socio-political account of cotton growing on the river systems of northern New South Wales rarely even touching Queensland. Success cannot be denied, yields are high, quality is good and cotton has leapt to fifth place amongst Australian exports. Why recommend it to our readers? Because taxonomists are concerned with the enormous ecological consequences of this success. There are now huge areas of laser levelled fields without a tree in sight. More water rights have been sold than there is water to supply them. Landholders downstream are now suffering from reduced flows. Botanically rich areas like the Macquarie Marshes with their significant numbers of aquatic birds are under threat. There has been cavalier use of fertilizers and pesticides which have contributed to a Green Darling River. This hugely successful venture makes a nonsense of 'sustainable agriculture' and demonstrates how little the ecological consequences are weighed against the enormous political clout of a successful export industry. One can only be relieved that efforts to extend cotton growing to the Cooper seem to have been halted for the moment.

The book makes fascinating reading. It documents the spectacular success of the industry. Some of the principal people appear in the scatter of illustrations, there is a simple map to keep one grounded. As usual the ecological consequences of the disruption of a major river system are only now evident and

the usual high price will be paid by a later generation.

The final paragraph in the book sums it up.

'Paul Kahl once described cotton-growing as a disease, meaning it could consume you. He has certainly passed on the fever to another generation or two. But unless the next generation can learn to farm the land without ravaging the river, and to protect their crop without poisoning the air, Paul Kahl's words may be more prophetic than he had intended, with cotton the cancer spreading through the countryside. Will they get the balance right, between profits and profligacy? For that is what matters in the end. ... The dedication and hard work of the cotton industry cannot be denied, nor can their financial contribution to both the local and national economy ... [But] Australia's greatest asset and most viable commodity is not cotton. It is people, healthy people, and their ability to produce and protect the future generations of our nation.'

David E. Symon

16 June, 1997

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History of Systematic Botany in Australia

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

\$30; 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*.

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.

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.

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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.

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