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ARTICLES

Dampiera fusca (Goodeniaceae): An extension of range, conservation status assessment, and identification notes

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Abstract

Recent field work has revealed the presence of *Dampiera fusca* Rajput & Carolin in the Tinderry Range (N.S.W. Southern Tablelands botanical district) south of Canberra. The species has previously been known only from restricted occurrences in the Kybeyan range area c. 80 km to the south, and the Nunniong Plateau in far north-east Gippsland, Victoria. Site information on the Tinderry Range population is provided and compared with the other areas of occurrence, and a conservation coding of 3RC- is recommended. Problems with keying out the species in the *Flora of Australia* and *Flora of New South Wales* treatments are discussed, and key amendments are suggested.

Introduction

In the course of field work in January 1993, a small population of *Dampiera fusca* Rajput & Carolin (1988: 205) was discovered in the Tinderry Range Nature Reserve, c. 47 km SSE of Canberra. Herbarium specimens were collected (*Lyne 1134 & Telford*; CBG, MEL, NSW). Approximately 20 plants were seen in a localized population at 35° 43' 41" S, 149° 16' 20" E (grid reference 8726 Michelago: 055,443), high on the western flank of the Tinderry Range at 1,400 m altitude.

The geology of the area is dominated by Tinderry Granite (biotite granite). The population found occurs in a shallow basin just below the

summit ridge, draining westward towards the Murrumbidgee River. All plants were growing on the floor of the basin in a well-drained coarse sandy granite-derived gravel with little humus present.

The plants occur in a sparse herbaceous understorey in an opening of *Eucalyptus pauciflora* and *E. latiuscula* woodland on the basin floor. The species does not occur on the adjacent slopes, which support a loamy soil with an open forest of the same two eucalypt species and a dense shrub understorey of *Ozothamnus thyrsoides*, *Olearia montana*, *Polyscias sambucifolia*, and *Oxylobium ilicifolium*.

Range

The species has previously been known only from restricted occurrences ESE of Cooma at the northern end of the Kybeyan range (c. 80 km S of the Tinderry Range), and the Nunniong Plateau in far north-east Gippsland, Victoria.

The Kybeyan Range populations occur on peaks and ridges at the edge of the tablelands escarpment at altitudes of 940 to c. 1,200 m, over a range of roughly 12 km, on the catchments of the upper Tuross and Wadbilliga Rivers. Vouchered localities are: [upper Bumberry Creek area] (*Parris 9169*; CBG, NSW); Kydra Peak (*Rogers & Willis*, 11 Jan 1970; holotype MEL 501963, iso NSW); and SE of Wadbilliga Trig (*Telford 3662*; CBG, MEL).

The Bumberry Creek site is dominated by *Allocasuarina nana* heathland, with recorded asso-

ciate species including *Eucalyptus* sp. aff. *radiata*, *Daviesia ulicifolia*, *Baeckea denticulata*, *Acacia lucasii*, *Pimelea collina*, and *Pultenaea* sp. The substrate is recorded as "loam over sediments", probably Ordovician metamorphics. The Kydra Peak population is recorded as occurring on sandstone (presumably the Lambie Shelf formation). The Wadbilliga Trig population is probably on similar Lambie Shelf formation substrates, and is recorded from "open eucalypt forest".

The Nunniong Plateau records (upper Buchan River catchment) were collected from ridge lines in the area of Brumby Point and Diggers Hole Track, at altitudes of 1,350–1,500 m (inferred). The associated vegetation is given on one label (*Forbes 267, MEL*) as *Eucalyptus pauciflora* with *Oxylobium alpestre* and *Poa australis*. The general area is dominated by mallee shrublands and montane sclerophyll woodland; and the geological substrates are primarily sedimentary and metamorphic strata, including slates and quartzite.

Conservation status

Dampiera fusca has not to date been assigned a ROTAP conservation code, but it qualifies as rare, given the small number of populations known and a probably narrow range of suitable altitudinal and habitat preferences.

The Tinderry Range population (c. 20 plants known) is within Tinderry Range Nature Reserve, and the Kybeyan Range populations (recorded as locally frequent) are all within Wadbilliga National Park. The Nunniong Plateau occurrences are within or immediately adjacent to Alpine National Park; these populations are scattered and of fairly low density (D. Albrecht & N. Walsh, pers. comm.). No significant threatening processes are known, but variations in fire regime and feral animal (goat, pig) disturbance would require management consideration at each site. Following the criteria of Briggs and Leigh (1988), a conservation code of 3RC- is here recommended (3, small populations over a geographic range of > 100 km; R, rare; C-, represented within reserves but population size unknown).

Identification

Some problems were encountered for this species when using the keys provided in the *Flora of Australia* treatment of the genus (Rajput & Carolin, 1992), and in the *Flora of New South Wales* (Carolin, 1992).

In Rajput & Carolin (1992), the key to artificial groups (p. 35) couplet 3 requires *D. fusca* specimens to agree with the clause "young stems flat,

triangular, or with a narrow groove ..." for successful identification (via Group 3). The Tinderry Range material has the youngest stems appearing subterete, although when a cross-section is taken they are seen to be obscurely triangular; older stems are fairly clearly 3-angled.

In Group 3 (p. 37), couplet 8 requires *D. fusca* to have "Corolla hairs yellowish grey, yellowish brown, or golden", as opposed to "grey or black". We have found this character state difference to be unreliable. Most specimens have an apparently two-layer indumentum, the lower layer comprising short (juvenile?) stellate hairs with more or less equal-length arms, and the basal branches of fully developed "type v" branched hairs (*sensu* Rajput & Carolin). The apparent overlying layer comprises the elongate arms of mature "type v" hairs. In the Tinderry Range material, the "basal layer" is dirty grey in colour, and the overlying layer is pale but not yellowish. Some other specimens from New South Wales provenances (e.g. *Rogers*, MEL 600175; *Cabbage*, NSW 100308) have the "basal layer" of a similar grey colour and the "overlying layer" not, or scarcely, yellowish. Other characters of the Tinderry Range material appear fully consistent with *D. fusca*, and there seems to be no serious reason to doubt its assignment to that species.

We suggest the following amendment to the *Flora of Australia* key in Group 3, to accommodate grey-haired material:-

- 14 Sepals distinct, > 1 mm long *D. sylvestris*
 14: Sepals minute (< 1 mm long, obscured by hairs), or obsolete
 15 Corolla indumentum more or less smooth-appressed, with "type iv" hairs (Western Australia) *D. loranthifolia*
 15: Corolla indumentum loose-ascending, with "type v" hairs (south-eastern Australia) *D. fusca*

In Carolin (1992: 452), couplet 2 requires *D. fusca* to have papillate stems. This is observable on a few specimens only; others lack papillae or have a loose indumentum obscuring the stem surface. To account for this, and to allow for the variability of the complex defined as *D. stricta*, we suggest the following amendments to the key:-

- 2 Stems always with a mid-dense conspicuous indumentum of stellate hairs on the upper few internodes, gradually glabrescent below; inflorescences very shortly pedunculate or sessile, flowers and subtending leaves forming congested pseudo-whorls on suppressed lateral branchlets; leaves cuneate-oblancoate to obovate in gross outline *D. fusca*
 2* Stems quite glabrous (or occasionally a short open indumentum of stellate hairs on newest

growth only); inflorescences usually obviously pedunculate, flowers and subtending leaves not (or only loosely) clustered along stems; leaves linear to oblong, elliptical or lanceolate in gross outline
(then resume key as published, at couplet 3).

Acknowledgements

Thanks to Ian Telford, Bob Makinson and Andrew Lyne for guidance with field work and the manuscript; David Albrecht and Neville Walsh for information on the Victorian populations; Joy Everett for comments on the keying problems; and the directors of the National Herbaria of Victoria and New South Wales for the loan of specimens.

This paper was prepared as part of work performed under the 1993 Botanical Student Internship Program of the Australian National Botanic

Gardens Herbarium.

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COMMENTARY

Celebration of botanists' birthdays

On 13th February 1993 a remembrance gathering was held in the Australian National Botanic Gardens, on the 250th anniversary of the birth of Joseph Banks. Short talks were given by Hon. Rae Else-Mitchell CMG, FRAHS on *Banks — the man*, and by Mr George Chippendale on *Banks' contribution to botany*. People gathered near the bust of Banks near the building, and there was a large birthday cake with a portrait of Banks in the icing. Very few botanists or members of ASBS were present.

I have a deep interest in the history of botanists whose heritage of achievement we have inherited; and I have long felt that simple celebrations such as this should be made highlights of our systematics society. With this in mind, I suggest the following people for consideration:-

- Robert Brown, b. 21-12-1773, d. 10-6-1858
200th anniversary in December this year
- Alan Cunningham, b. 13-7-1791, d. 27-6-1839
- George Bentham, b. 22-9-1800, d. 10-9-1884
- Ferdinand Mueller, b. 30-6-1825, d. 9-10-1896
170th anniversary in 1995
- Joseph Henry Maiden, b. 25-4-1859, d. 16-11-1925
- William Faris Blakely, b. Nov. 1875, d. 1-9-1941
120th anniversary in 1995. Does anyone know

the actual date of birth?

My list is only a beginning, originally based on people who have contributed to the study of *Eucalyptus*, with suggestions for celebrations of some forthcoming anniversaries. However, there could easily be small remembrances more regularly — perhaps with a cake for morning tea, or a social dinner, or even a mention at a meeting.

George Chippendale
4 Raoul Place
Lyons, A.C.T. 2606.

Newsletter

In his recent report about competency ratings (*Newsletter* 73: 16-17), Jeremy Bruhl drew attention to the important role that ASBS plays in bringing together people with an interest in plant nomenclature, whether it be of a professional or an amateur nature.

Many members, like myself, are not practicing systematists. Such people rarely have the time or the resources to keep in touch with all of the relevant literature, but we all like the gossip of the "births and deaths" columns in the botanical nomenclature field. ASBS is the major source that we have to find out about what is going on in this

complex and ever-changing field. The *Newsletter* is always interesting to such members, because its contents are eclectic and informative. However, this forum could be used even more effectively to keep the society's members in touch.

Here are a few alternatives, listed according to increasing merit and editorial input. No doubt these suggestions could be improved on.

- Reproduce the contents pages of the journals of the various Australian herbaria and the *Flora of Australia*, and list titles of important revisions of Australian plants published in overseas journals (titles supplied by the authors)
- Summarize the latest nomenclatural changes in the above publications, concentrating on the best-known and most widely-dispersed taxa
- Reproduce the abstracts, or summaries, of all papers listing new Australian species. Some editorial comment could be given in contentious cases.

Rather than falling entirely on the editors' shoulders, each herbarium could appoint an *ASBS Newsletter* officer, or perhaps the task could be a role for regional councillors. The cost of such an exercise should not be a deterrent, as the *Newsletter* would then be more of an indispensable reference and thus more valuable to subscribers, although it may need to be produced more often to avoid heavy postage costs.

Perhaps this approach would also be of interest to practicing systematists who, with other commitments, may find it difficult to keep up to date.

Gabriel Crowley
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Cairns, Qld. 4870.

I never wrote to the authors for reprints of the following articles

Article 1

Yoreggelt, Magyar (1980) A revision of the genus *Welwitschia*. *J. Tuscaloosa Bot.* 17: 8-119.

Abstract

This genus, formerly considered as monotypic, is divided into 2 new genera, 17 species, and 8 varieties (one of them doubtful). The study was based on 25 fragmentary herbarium specimens and 2 cultivated seedlings. The author, a graduate student, hopes to study this plant in its habitat next

year.

Article 2

Morgen, Guten (1981) A re-consideration of the genus *Welwitschia*. *J. Newfoundland Bot.* 18: 11-13.

Abstract

The author, having seen this plant in its habitat on a two-day trip in 1961, offers a rebuttal of work done at the University of Tuscaloosa. The genus is restored to its previous status. The genus *Pinus* is also included within it, and 1,124 new combinations are made.

Article 3

Utro, Dobro (1982) What, if anything, is a *Welwitschia*? *J. Plagiarized Studies* 8: 119-130.

Abstract

A middle line in *Welwitschia* studies is proposed. *Pinus* is restored to its previous status, and 1,826 new combinations are made.

Article 4

Anon. (1982) Obituary of I.M. Filer (1924-1982) *Science* 227: 87.

Abstract

Dr Filer, an editor with *Biological Abstracts*, was responsible for indexing new taxonomic combinations. The reason for his suicide is unknown.

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D.C. Speirs
Canada.

Myoporum insulare

In days gone by the boobialla
Played its fair part in rural squaller,
But on home gardens casts a pallor,
Its pruned fram diseased, sere and yellow.

Graham Calcutt
Who Planted That Damned Thing?

A.S.B.S. Inc. BUSINESS



Fifteenth General Meeting

Minutes of the 15th General Meeting

Hobart, Wednesday 20 January 1993

University of Tasmania
Hobart, Tasmania.

Meeting opened at 5.36 p.m.

1. Attendance: 19 members were in attendance at the General Meeting; Michael Crisp presiding.

2. Apologies: G. Guymer, R. Hill, D. Morrison, T. Orchard, B. Wiecek.

Note: Before the business of the Meeting commenced, Michael Crisp introduced two of the three overseas participants who were financially supported by the Society so that they could attend the "Southern Temperate Ecosystems: Origin and Diversification" Symposium. Mary Kalin Arroyo (Chile) and Jeremy Midgley (South Africa) expressed their gratitude for the support provided by the Society, and each summarized their research interests and its relevance to this Symposium. The third participant who received support from the Society, Irma Gamundi de Amos (Argentina), was unable to attend the Meeting.

3. Minutes of the 14th General Meeting held in Sydney, 28 March 1992: It was proposed that the Minutes of the 14th General Meeting (as published in the *Austral. Syst. Bot. Soc. Newsletter*) be accepted as a true record of that meeting (moved J. West; seconded C. Puttock). Unanimously agreed to by the Meeting.

- a. Business arising from Minutes: None.
- b. Additional items: None.

4. President's Report: The President's report was presented by Michael Crisp.

After only nine months in the job, I felt that

surely there cannot be much to report. However, the Society has been very active, especially in organizing symposia, which are one of our main activities. Last August, some of us met with the American AIBS in Hawaii, and this year we have the current meeting on "Southern Temperate Ecosystems", as well as the symposium on "Systematics, Ecology and Conservation of the Western Australian Biota" in Perth next September. Meanwhile, planning is well advanced for the meeting on "Origin and Evolution of the Flora of the Monsoon Tropics" next year. It is great to see that meetings are being held in some of the most far-flung parts of Australia (although that depends upon your point of view). It gives all our members a chance to participate.

It is just as well that our Society is meeting every year, because we are now forced to do so under the new Incorporated Associations legislation. Unfortunately, we have been caught in a net cast for those operating shady businesses, but it means more bureaucratic control of our meetings and finances, as well as higher costs. It also means that we have to adopt a new constitution, which we shall discuss in this meeting. However, it is probably a good idea to bring our practice into line with other associations. Thanks to our constitutional subcommittee and public officers, especially Rod Henderson, for burning the midnight oil over the new constitution.

Over the last year or two, many new faces have appeared on council and in our other offices, such as *Newsletter* editorship and Public Officer. To see our younger members becoming actively involved in our affairs is a healthy sign: it gives the prospect of a dynamic future. At the same time, we must thank those who have served their time and contributed so much: Judy West, Barry Conn, and Gordon Guymer.

Last March, I promised that ASBS would do more to assist students and thus encourage them to take up our profession and join the Society. Well, I am happy to announce that Council has decided to provide support for students who speak on plant systematics at ASBS symposia, starting with the present meeting on "Southern Temperate Ecosystems". We are giving Alison Shapcott and Gregory Jordan of the University of Tasmania, and Leonie Scriven of the University of Adelaide \$50 each towards their registration fees, plus free membership of the Society for one year. Council also plans

to award prizes to outstanding undergraduate performances in plant systematics in Australian universities. This should bring us prestige, as well as encouraging the best students to continue into post-graduate degrees in our field of research.

Finally, I wish to remind you of a sad event which occurred during the last year. We have lost one of our most long-serving and most loved members: Hansjoerg Eichler. It was a great blow especially for us in Canberra and Adelaide, who had benefited from his freely-given advice and encouragement. He was a principal mover in getting the *Flora of Australia* off the ground, and he gave special encouragement to students, myself included.

Michael Crisp made the following comments on the Student Travel Support Scheme and the University Undergraduate Prize, in response to questions from the Meeting. Students who were either presenting posters or making oral presentations at a symposium would be invited to apply for financial support. Each application for support would be required to include an Abstract of the presentation. Council would consider all applications, to determine the appropriateness of the presentations to plant systematics.

At the "Southern Temperate Ecosystems" symposium, selected students were chosen by Council from a list of participants. This informal arrangement was used because the student participants had not been informed of the Scheme prior to the Symposium.

The University Undergraduate Prize that is to be offered to students attending Australian Universities would not necessarily be a financial award. It would be more likely to be a prize, such as one of our published books.

The rules and procedures for operating the Student Travel Support Scheme and the University Undergraduate Prize have still to be finalized.

5. Treasurer's Report: The Treasurer's report was presented by David Bedford (and is included at the end of this report).

With consideration for the errors in the summary of receipts and payments (made by the auditor), the Meeting was asked to accept the report as a true statement of our financial accounts (moved T. Entwisle; seconded J. Playford); unanimously agreed to by the Meeting.

6. Newsletter Editors' Report (read by Barry Conn).

David Morrison and Barbara Wiecek have continued to be editors of the Society's *Newsletter*.

Three issues have been produced since the last General Meeting (28 March 1992, Sydney). *Newsletter* No. 71 was a larger issue (40 pages) than each of numbers 72 and 73, mainly because eleven and a half pages were dedicated to the publication of the Minutes of the 14th General Meeting and the associated Council Meeting. Number 72 had 32 pages and no. 73 had 20 pages. An index to the *Newsletter* volumes 31 to 50 was also produced.

The occasional late contributions continue to cause difficulties, but we have generally been able to include these in the current issue, while keeping (more or less) to the publication deadline. We thank all of those people who contributed articles for the *Newsletter* in 1992. Most of the contributions have arrived unsolicited.

We feel that the wide range of topics covered by these articles continue to make the *Newsletter* a very worthwhile publication for the Society. However, we would like to encourage a wider group of members to contribute. We would also encourage people to submit a computer disk copy of their contribution. Many of the contributions that we receive have clearly been produced on a word processor, and yet they have to be re-typed because only a printed version is supplied — this costs the Society money, as well as slowing down the production process.

We also wish to thank the small group of conscientious helpers at NSW who assist with the insertion of pamphlets into the newsletters, and other mailing and handling procedures. Their assistance greatly reduces the work-load of Barbara, who takes responsibility for this aspect of the production.

7. Future activities:

Hobart 1993 — The Meeting agreed that the Symposium was extremely well-organized, and that Dr Bob Hill deserved acknowledgment for his effort. Michael Crisp informed the Meeting that the proceedings concerned with conifers will be published. N. Enwright and R. Hill have agreed to edit this volume. Council has offered financial support to the publication, and expect to invest about \$2,000 in this project. The Society will be a joint publisher, and copies of the publication will be available to the membership at a reduced rate. The systematic papers from this symposium will be published in *Australian Systematic Botany*, as long as they meet the standards set by this journal.

Perth 1993 — Jenny Chappill summarized the progress made in the preparation of the "Systematics, Evolution and Conservation of the

Western Australian Biota" symposium for 30 September – 2 October 1993. This symposium will be held at the University of Western Australia. The organizing committee is made up of: S. Hopper (Chairman), J. Chappill, M. Harvey, N. Marchant, K. Aplin and B. Lamont. The second advertising flier will be circulated soon. It is planned that the proceedings of the symposium will be published in honour of Sid James and Bert Main. Surrey Beattie have been approached to publish the proceedings. Co-publication with the Society has not been settled. The volume will be available to participating members at a reduced rate. The Society will provide \$1,000 to cover operating costs, and \$1,000 (non-refundable) is to be offered to selected speakers to subsidize their expenses in attending the symposium.

North Queensland (July 1994) — Michael Crisp summarized the progress made in the preparation of the "Origin and Evolution of Monsoon Forests" symposium for 4–6 July 1994. This symposium will be held at Tinaroo, North Queensland. The organizing committee consists of John Clarkson, Betsy Jackes, Bernie Hyland and Elizabeth Brown. A three-day field trip will offer an excellent opportunity to view a cross-section of tropical ecosystems. A bryological workshop will be organized to coincide with this symposium.

1995 — No conferences were planned for 1995. Therefore Council would be interested to hear from anyone who might want to organize a conference during that year. However, it may be appropriate that no meetings are held in 1995, since the Society has a very full program for the next few years.

Melbourne 1996 — Tim Entwistle outlined the initial progress of the "From Mueller to the Next Millennium" symposium (working title only), probably to be held in February/March or August/October 1996. The symposium is to celebrate 150 years since the inception of the Royal Botanic Gardens Melbourne, and to commemorate 100 years since F. Mueller's death. Although the program is still being developed, two themes were proposed, and these would run concurrently. One conference: "19th Century Australian Science" would deal with historical and philosophical aspects, whereas the other conference "Taxonomy (Now and the Future)" would deal with several topics, including: "How well do we know the Australian flora?", "What will be the role of herbaria in the next millennium?", "Applications and implications of computer technology", "Nomenclature", "Circulation and credibility of published information", "Why publish floras?" and "International

exchange of data". Since these topics were only preliminary suggestions, further ideas should be sent to Dr J. Ross (Symposium Chairman of organizing committee).

8. Constitution: Michael Crisp summarized the reasons why a new Constitution is required (as outlined in *Austral. Syst. Bot. Soc. Newsletter 71*: 21–22), and listed the major changes to the proposed Constitution since those mentioned in *Austral. Syst. Bot. Soc. Newsletter 73*: 6–7. Council has decided that voting by proxy at meetings is not appropriate for the Society, and this has been removed from the Constitution. Although Council finds the rules and procedures dealing with the disciplining of members unpleasant, it has been reluctantly agreed that these should remain in the Constitution. The Meeting expressed some concern as to the formality of the procedures for becoming a new member of the Society. It was agreed that the "nomination form" should be renamed an "application form", unless it did not meet the requirements of the Act. It was agreed that the Constitutional Subcommittee be given the authority to consider making changes to Rule 3 in line with the sentiments of the Meeting and in accord with the Act.

It was agreed not to include the subscription rate in the rules of the Constitution.

Since more flexibility might be required should a meeting need to be re-convened, it was agreed that Rule 25(3) should read:-

"If within half an hour after the appointed time for the commencement of a general meeting a quorum is not present, the meeting if convened upon the requisition of the members shall be dissolved and in any other case shall stand adjourned to a suitable time and place as specified at the time of the adjournment by the person presiding at the meeting or communicated by written notice to members given before the day to which the meeting is adjourned."

The proposed Constitution does not include any rules or procedures for the dissolution of the Society. The Meeting agreed that this should be included if the Act does not provide guidance on this issue.

Judy West suggested that the financial year of the Society should be changed to 1 July until 30 June, rather than being a calendar year. Michael Crisp informed the Meeting that Council had already discussed this and had decided not to change from the calendar year because it was significantly cheaper to get the accounts audited during this off-peak period. The Meeting agreed to retain

our current arrangement.

Carolyn Mihaich moved that this Constitution, as amended (subject to requirements of the Act, to be considered by the Constitutional Subcommittee), be put to the members for adoption as the Society's new constitution (seconded P. Heyligers). Unanimously accepted by the Meeting.

9. Membership Subscription Rate: Since the financial accounts of the Society have shown a deficit for the last financial year, Council proposed that the annual subscription be raised to \$30 (Regular Member) and \$15 (Student Member). Last year's subscriptions raised \$6,750, but our *Newsletter* costs \$6,233. This only left the Society with \$517 to cover other expenses.

The issue of the value of our subscription to FASTS was raised by J. Playford. She suggested that if the Society did not believe that membership to FASTS was of sufficient value, then this would be one way of reducing the expenses of the Society. It was pointed out that membership to FASTS cost the Society \$1,353. Considerable discussion followed on the value of FASTS to the Society. Michael Crisp informed the Meeting that this topic had been discussed extensively by Council, and that it was decided that FASTS would be approached to speak to the Society, if this Meeting was dissatisfied by FASTS' performance. It was proposed that Michael Crisp should discuss our concerns with our FASTS' representative (agreed to by the Meeting).

10. Any other business: None.

Julia Playford moved a vote of thanks to Council for their efforts in managing the Society (seconded P. Heyligers). Carried by the Meeting.

11. Council elections: The Returning Officer (Barry Conn) notified the Meeting that the following people were elected to the Council:

Michael Crisp (President), Jenny Chappill (Vice-President), Christopher Puttock (Secretary), Peter Wilson (Treasurer), John Clarkson (Councillor), and Timothy Entwisle (Councillor).

He also confirmed that the Public Officer was Andrew Lyne.

Michael Crisp thanked the out-going members of Council for their support and welcomed the new council members.

Meeting closed: 7.14 p.m.

Barry Conn
Secretary, ASBS Inc.

Treasurer's report for the financial year ended 31 December 1992

An audited summary of receipts and payments for the year ended 31 December 1992 accompanies this report. The summary, together with a copy of this report, will be lodged with the Department of Corporate Affairs in Canberra to fulfil our obligations under the Act covering our incorporation in the A.C.T.

Membership of the Society: Membership stands at 426 members, including 16 student members.

The Accounts: Except for particular points, I will let the accounts stand for themselves, rather than spelling them out. There is one correction immediately apparent, as the auditor included one payment of \$1,000 to the Southern Connections Conference under printing instead of under seminar-speakers, so printing should be \$6,233 and seminar-speakers should read \$4,390.

The most important thing to notice is that the Society made a loss for the operating year. This is primarily due to extra-ordinary expenditure items, such as the Society's contributions to the Southern Connections Symposium (\$3,500) and the PATN workshop (\$890). It is also of note that the *Newsletter* printing costs have increased slightly, from \$5,873.33 in 1991 to \$6,233 in 1992.

The Society's financial situation is still quite healthy, as net assets stand at \$40,239.

Subscriptions: Subscriptions remain the primary source of income. As previous Treasurers have done before me, I lament of the late payment of subscriptions. Cheques trickle in through the year, with a surge after we ceased to send newsletters. Unfortunately, notification of overdue subscriptions failed to mention that the 1992 rate would increase to \$25.00; so many members were able to pay arrears and 1 year in advance at the old rate.

Sale items: This has been a desultory year for sales, at least as far as monies received by the Treasurer record. There is obviously a need to try to sell our stock more effectively.

FASTS: Our subscription to FASTS for 1992 was \$1,353. This is only a slight increase on 1991, but represents a significant cost to the society. The Council should consider whether the expenditure is warranted by the representation we actually receive. It should be noted that, at \$4.00 per annum per

member, our 1993 subscription will increase to over \$1,600.

CSIRO journals: Many members continue to take their time to respond concerning CSIRO journal subscriptions at concessionary rates through the Society. As this service takes a considerable amount of the Treasurer's time, the Society should consider adding a surcharge, to ensure that the Society gains material benefit from this work, and/or consider whether this service or its administration should be modified in some way.

Assets: There is a need to improve control over the Society's assets, consisting of merchandise, books, and newsletters. Because the stock is of necessity distributed widely, it is difficult for the Treasurer to keep track of it. After discussion with our auditor, I suggest that Council institute a new system for stock control and stocktaking.

Farewell: When I accepted the position of Treasurer, I expected to fulfil the role for some years. However, changes in my life have made it inappropriate that I continue. I wish the new Treasurer and Council well.

D.J. Bedford
Treasurer, ASBS Inc.

**Australian Systematic Botany
Society Inc.
Statement of Receipts and
Payments for the Year Ended
31 December 1992**

Receipts

Donation to Research Fund	522
Interest received	
- Cheque account	655
- Term Deposit	902
- Savings account	38
Sales	
- History Symposium Book	933
- Arid Zone Symposium Proceedings	25
- T-shirts, sweat shirts etc	15
Subscriptions to ASBS Inc	6,750
Subscriptions CSIRO Journals	2,851
Workshop	981
TOTAL RECEIPTS	13,672

Payments

Artwork	150
Auditors remuneration	
- Audit	660
Bank charges	23
Filing fees	36
General expenses	60
Postage	779
Printing	6,233
Publications	310
Returns	
- Maude Gibson Trust	607
- WR & RM Barker	485
- P Short	837
Search fees	10
Seminars	
- Speakers	4,390
Stationery	68
Subscriptions	3,118
Travel and accommodation	339
Typing	116
TOTAL PAYMENTS	18,220
NET DEFICIT	(4,548)

**Australian Systematic Botany
Society Inc.**

**Balance Sheet as at
31 December 1992**

TOTAL MEMBER'S EQUITY	40,239
Current Assets	
Cash	
- Bank a/c - cheque	14,178
- Bank a/c - research fund	2,851
Term Deposit	10,000
Term Deposit	1,400
Inventories	
- Society Newsletters	1,537
- T-shirts, sweat shirts, mugs	4,778
- Books - Evolution Flora & Fauna	349
- Books - Systematic Botany	5,147
	40,239
Current Liabilities	

NANCY BURBIDGE MEMORIAL LECTURE

Vegetation change in the Australian Tertiary in response to climatic and phytogeographic forcing factors

Elizabeth Truswell
Australian Geological Survey Organisation

Abstract of the Nancy Burbidge Memorial Lecture, Hobart 1993. The full paper will be published in *Australian Systematic Botany*.

It is more than ten years since there were major reviews of Australian Tertiary vegetation history. Since then, information has accrued from both palynology and plant macrofossils, such that the fossil evidence must now be considered a primary source of data for understanding the evolution of the Australian vegetation during that formative period.

There have been major advances, too, in understanding the framework against which the fossil data must be set. For instance, there have been comprehensive syntheses of Australian Tertiary geology and palaeo-environments; and there have been improvements in understanding the tectonic relationship between Australia and regions to its north, and between Australia and Antarctica. The time-scales against which changes must be measured have also been refined, as has our understanding of the climatic factors affecting the continent during that interval.

A broad review and evaluation of the evidence currently available, using this information, shows that shifts in community dominance during the Tertiary can be linked to independently established patterns of warming and cooling, and with precipitation changes viewed at the regional level.

The record now available, in spite of its limitations, and its bias towards wet habitats, gives a general picture of a transition from widespread very diverse, and complexly-patterned rainforests, to predominantly open vegetation, with rainforest restricted to wetter regions. The rainforest elements identifiable in the early Tertiary are now segregated out along a latitudinal gradient in eastern Australia.

This process of opening out may go back a

long way: banksias in the Eocene may record the development of sclerophylly then; and the acacias now go back nearly as far, and were well established in the Oligocene.

By at least the mid Miocene there was heath-like vegetation established locally in coal swamps, under particular fire regimes. Drier rainforests, with abundant *Araucaria*, seem to have been established first at inland localities, perhaps because the *Nothofagus brassospora* group couldn't compete effectively under more seasonal rainfall. There may have been wet sclerophyll forests in the late Miocene; grassland and savannah seem to have become established in the late Pliocene, but their history is sketchy and there are no data from northern Australia that can be linked in a continuous way with modern savannah vegetation.

No modern analogue can be found for the enigmatic Pliocene and Pleistocene daisy-rich vegetation, such as at present Lake George. The expansion of the eucalypts — probably at the expense of the drier rainforests and *Casuarina* woodlands — is a more recent story; and its possible links with human land-management practices is a separate issue not pursued here.

In a phytogeographic sense, examination of the currently-available Tertiary record re-affirms that the history of the Australian flora is largely one of differentiation from Gondwanic stock. It does, however, indicate that geographic isolation of the Australian continent was not as extreme as plant geographers have indicated in the past. Palynological data clearly shows that there was a degree of interchange of taxa across sea barriers to the north, probably as far back as the Early Cretaceous. To the south, rapidly-accruing information from Antarctica shows this region to have been both a source area and a dispersal corridor for a number of taxa that now have disjoint distributions in mid to low latitudes.

REPORTS



Australian Biological Resources Study

The Flora Section of ABRS has been gradually re-building its staff resources after the loss in quick succession of Alex George, Paul Hattersley, and Savita Meek late last year. As a result of the recruiting exercise in November/December 1992, I was appointed Executive Editor, *Flora of Australia*, and Helen Thompson was promoted to Scientific Editor.

I am acutely aware of the enormous gap left in the organization by the departure of Alex George, and of the difficulties that I shall be facing in trying to carry on the project to the high standards that he developed. His immediate input to the project will be sadly missed in many areas: editorial standards, in-depth knowledge of authors and their research interests, nomenclature, and much more. However, he will not be allowed to escape by moving back to Perth, as we have his phone and fax numbers! Helen Thompson's well-deserved promotion should greatly assist the flow of manuscripts through the Flora Section. She has been given special responsibility for the final typesetting and layout tasks of volume preparation, and she will also be our main liaison person with the publishers.

In the last few months, we have also been fortunate enough to recruit Tracey Rand and Katy Mallett as Temporary Assistant Scientific Editors, to help with basic editing processes; and Jane Mowatt is at present acting in the position of Scientific Editor that I vacated. With this supplementation of our staff resources, we are once again almost back to full strength. Alex George has been retained on contract until mid-March to see *Volume 50* through to completion. This is the first of the off-shore territories volumes, including accounts of

the floras of Christmas, Cocos (Keeling), Macquarie and Heard Islands, Ashmore Reef, and the Coral Sea Islands Territory. We hope to have it in print by the end of the financial year.

A new round of recruitment is currently in train, with advertisements for Scientific Editor and Assistant Scientific Editor closing on 5th March. Once these appointments have been made, we expect editing to proceed smoothly on *Volume 49* (the second of the territories volumes, covering Norfolk and Lord Howe Islands), *Volume 55* (the second volume dealing with lichens), and *Volume 59* (the introductory volume of fungi). These are currently scheduled for publication in early 1994, mid-1994, and late 1994, respectively. A number of other volumes, including *Volumes 2, 5, 16, 17,* and *33*, are also being worked on as time allows.

The Preferred Objectives for 1994 funding under the ABRS Participatory Program were listed in the last issue of the *Newsletter*, with applications for new projects and renewals of previous ones closing on 10 April. Applicants should note that new forms have been developed for this year's round, with the intention of making application simpler. These forms are obtainable from major herbaria, museums, and universities, or direct from ABRS.

It will be noted that the list of plant taxa is longer this year than in most previous rounds. This reflects the expanding scope of the *Flora of Australia*. In its infancy, it had only flowering plants, gymnosperms, and ferns within its immediate goals. However, even then, it was envisaged that eventually it would expand to include various cryptogamic groups. The lichens were the first of these groups to get underway. Substantial work has also been done on the introductory volume of fungi. Work on the bryophyte volumes is also well advanced, and we can expect the first of these to be in print by perhaps late 1995. The final major group, the algae, is now in the planning stages. We hope to establish a classificatory framework for publication of this diverse assemblage of taxa during the course of this year, and for the first time we are offering funding for research and flora text preparation of some algal groups in the 1994 Participatory Program.

ABRS has also let two major contracts during the last few months. The first of these, to CSIRO, is designed to facilitate the development of the

DELTA plant descriptive package, enhancing its already very useful features, making them more user-friendly. It is hoped that these enhancements will make DELTA even more attractive to researchers, flora writers, and other practitioners in the field of taxonomy. The second contract, to a group headed by Tim Entwisle (MEL) and Peter Tyler (Deakin University), is for the preparation of a database of species records and literature relating to freshwater algae in Australia. This project, to be completed by the end of 1993, is the first step in the development of the algal equivalent of the *Australian Plant Name Index*, a tool that is becoming increasingly useful in taxonomic research in general, and in the preparation of the *Flora of Australia* in particular.

Please note the following contact numbers and addresses for ABRS. Much of our mail still goes to addresses that we occupied up to three moves ago!

Australian Biological Resources Study
Flora Section
GPO Box 636
Canberra. ACT. 2601.
Fax (06) 250 9448
Tel (06) 250 9443 Helen Hewson
(06) 250 9442 Tony Orchard

Tony Orchard
Flora of Australia



**Australian
Botanical
Liaison
Officer**

Winter has been predominantly cold, damp and gloomy here, and the tow path has turned into a muddy ditch, forcing me to ride on the streets and do battle with the London traffic. Thankfully, flowering daffodils, crocuses and prunus are now signalling that Winter is almost over. Surprisingly, there has been no snow, and frosts have been almost restricted to the few cloudless nights. This

has made me wonder whether more Australian native plants from the higher parts of the Great Dividing Range might grow happily here. Surely Blackheath is colder than London in winter? If so, then maybe *Telopea speciosissima* et al. might find a suitable uncovered niche at Kew and elsewhere in Britain.

Inquiries have been coming in at a steady rate. In the course of answering some of these, and in my own work on *Persoonia*, I have been surprised by the number of specimens collected by Robert Brown that are held by Kew. It turns out that I should not have been surprised at all. According to Mabberley (1985), Kew acquired specimens of 3,105 species from the original distribution of Brown's herbarium, after the death of John Bennett in 1876, and subsequently received additional duplicates. Many of these sheets possess original labels annotated by Brown, as well as blue labels headed "R. Brown, Iter Australiense, 1802-5 [Presented by direction of J.J. Bennett, 1876.] No.". Moreover, some of the Kew sheets (e.g. Brown's specimen of *Melaleuca ericifolia* Andr. from Kent Group, Bass Strait) apparently are not represented by duplicates at BM. Stearn (1960: xxvii-xxviii) notes that "All [specimens thus labelled] are authentic specimens (syntypes); as Brown re-examined his material before publishing the *Prodromus* it seems wise to select as the lectotype of a Brownian species the most complete individual specimen in the British Museum annotated by Brown which displays the characters stated in his diagnosis." Nevertheless, sheets at K (and presumably other herbaria such as E, MEL and NSW) are eligible candidates for lectotypification, especially in the absence of material at BM.

Several Australian visitors have come through Kew since Christmas. Stuart Davies (ex NSW, and now doing a Ph.D. with Peter Ashton at Harvard University) examined specimens of *Macaranga* (Euphorbiaceae) for a phylogenetic/ecological analysis of one of the sections. He has been working in the field in Borneo for the last year, and he gave a well-received seminar on his research to Kew's "South East Asian Group". Karen Wilson (NSW) chaired the IOPI meeting at the Natural History Museum, and she also spent time working on collections of Cyperaceae at K and P and updating me on NSW news. Gillian Perry (PERTH) and her husband Mike Perry (University of W.A.) spent several weeks here working on nomenclatural matters (GP) and *Lathyrus* (MP).

The most exciting development here is the progressive occupation of the "extension" to the Jodrell Laboratory. The Jodrell lab was instituted

in 1876 (Hepper 1982), and moved into the existing, "old" building in 1965. By 1987, when Professor Mike Bennett was appointed as Jodrell Keeper, the existing premises had clearly become inadequate. Since 1965, electron microscopy had become essential in descriptive and analytical botany, personal computers and local area networks had arrived, and molecular systematics looked set to make the rest of us redundant. Thus, planning commenced for expanded and improved lab facilities.

Professor Bennett has just taken me for a guided tour of the new-look Jodrell building, for which "extension" is something of a misnomer. The total floor area has been expanded from 1,000 to 3,000 m², and all parts of the old building are progressively being evacuated and completely refurbished. In fact, the impression that one gets is of a completely new building that has been designed from scratch as an integrated whole. The new common room, seminar room, atrium and reception are central in the building and connect directly to the existing lecture theatre, providing excellent conference facilities. Each floor is based on a rectangular, "circulating" corridor that runs through the inner side of each main laboratory. The idea behind this design feature was to minimize separation between different research groups, thus fostering interaction. When the building is finished, the main route from the Cumberland Gate to the Alpine House will run alongside the large windows of the western wall of the Jodrell, allowing the public to watch the white-coated scientists in their native habitat. A fibre-optic network supplies multiple LAN connections to each room.

"Palatial" is the wrong word to describe the building, given that most of the >£2.5 million spent has been put into function rather than superficial appearance. Nevertheless, most biologists will be green with envy when they see the space and facilities available here. The new molecular biosystematics lab, for example, has dimensions of roughly 10 x 20 m, and comfortable working room for up to 20 scientists. Presently, this section has two full-time staff members. The neighbouring biochemistry lab is of similar size, and the two share a large prep room. Separate containment and PCR rooms are additional features. I lost track of the number of rooms devoted solely to electron microscopy.

These labs are being supplied with state-of-the-art equipment, including machines for SEM, TEM, HPLC, GCMS; NMR, PCR, centrifuges (both high-speed and ultra), ultrafreezers, ultramicrotomes, growth chambers, cool rooms, and a

machine that goes ping. The only piece of equipment that is notably missing is an automated DNA sequencer, but I would not be surprised if one turns up soon, given Kew's impressive new commitment to molecular biosystematics.

Each research scientist has a roomy office, complete with work-desk and ergonomic computer table. There is an open-plan office with places for 20 research students, each provided with their own desk, filing cabinet, book-shelves, and computer. Another room has similar facilities for four visiting scientists. The computer and image analysis suite will house up to 10 specialist workstations.

Given the quality and scale of these facilities, prospective ABLOs ought seriously to consider basing their research proposals on laboratory work in the Jodrell. You are welcome to discuss such proposals with Dr Mark Chase (molecular biosystematics), Dr Linda Fellows (biochemistry), and Dr David Cutler (anatomy).

Another building undergoing major surgery is the Natural History Museum, particularly the roof of the main phanerogamic herbarium, which will be replaced shortly. Workmen have just finished building a false ceiling in the herbarium, supported by scaffolding, upon which the major building work will be completed. As you can imagine, botanizing in the herbarium has been difficult, due to noise and the presence of numerous new obstacles such as scaffold supports, which have prevented access to large sections of the collection from time to time. Hopefully, the worst of these disruptions are now over.

A major forthcoming Kew event is the "International Symposium on the Classification and Evolution of the Monocotyledons", to be held here from 18-23 July. Just about all of the big names in monocot systematics (and a few others too) have been persuaded to contribute papers on subjects ranging from fossil monocots to vascular organization to rbcL sequence data, but primarily on the phylogenetic relationships of various monocot groups. Write to Dr Paula Rudall, Jodrell Laboratory, if you want information on this meeting.

I am off for three weeks from tomorrow (27-2-93), for a week in Scotland (mostly holiday) and two weeks in Europe (mostly work), so I apologize in advance for any delays in the processing of ABLO inquiries. That's all from me for now.

References

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- Mabberley, D.J. (1985) *Jupiter Botanicus: Robert Brown of the British Museum*. British Museum (Natural History), London.
- Stearn, W.T. (1960) An introduction to Robert Brown's "Prodrum Florae Novae Hollandiae", pp. v-111 In: R. Brown, *Prodrum Florae Novae Hollandiae et Insulae van-Diemen*, facsimile ed. Wheldon & Wesley, Codicote.

Peter Weston
ABLO

FASTS board meetings and annual general meeting

Sydney 23 November 1992
and 15 February 1993

The last two Board meetings of FASTS were somewhat dominated by discussion concerning the row between FASTS' Executive Director, Dr David Widdup, and the Minister for Science, Mr Free. Although there was some agreement on the Board that David could have been more careful in his wording when responding to the Minister's repeated attacks, the Board was unanimous in defence of our right to criticize the Minister (or anyone else, for that matter) on issues of Science & Technology policy. The White Paper was and remains a damp squib, and the Minister completely over-reacted, and that's all there is to it.

The Coalition's Science & Technology policy has not even seen the light of day yet, and I don't hold out much hope for what it will contain, given the drafts that I have seen. Simply claiming, as the draft policy does, that the private sector will pick up the tab for Research & Development in this country is silly in the extreme. In this context, I note that such an industry-funding proposal has been made for the Arts by the Coalition, an equally-ridiculous suggestion. No wonder the Arts community loves Mr Keating!

The FASTS Board has produced a Manifesto (I did object to the term, but to no avail), and this is attached at the end of this report. It is also trying to get Science & Technology onto the election agenda, but I doubt that it will work. Unfortunately, the GST and unemployment will probably remain the only issues, although there is very little in those issues other than point-scoring, grandstanding, and pork-barrelling. It was also decided

that the Board would issue a series of press releases on individual issues such as the environment, health, university research funding, etc. A challenge was also issued to Messers Free and McGauran to debate the Science & Technology policies of their respective parties, but nothing has come of that.

FASTS, regardless of which party wins office on March 13, will develop a National Science & Technology Policy to carry Australia into the 21st century. The Board was unanimous that it should do this, building on elements of policy that are already in place. A proposal was made to adopt a process for policy-making that will probably be put in place, bearing in mind the timing of yearly federal government budget cycles. This probably means a shift in dates for Board meetings, etc. I will keep you posted. In the meantime, I would be very happy to receive suggestions from member societies and individuals for what the National Science & Technology Policy should contain.

By the time that members of societies in the Plant and Ecology group read this, the election will be behind us, and you can all take me to task.

Christa Critchley
Board member for "Plants and Ecology"

A manifesto for Australia's future from the Federation of Australian Scientific and Technological Societies

Existing economic and industry policies in Australia have clearly failed, and we now have one million unemployed and a balance-of-payments disaster. We believe that future employment and future prosperity depend on the development of innovative technologies and their exports; and in turn this will depend on a strong national system for research and development. Environmental protection and the health and safety of people also rest heavily on science and technology.

Planning for our future cannot be left to just market forces. Few companies in Australia have the resources to develop innovative products and processes by themselves. They need financial help; and they need guidelines from the community on the kind of technological future that will be in the best interest of Australia. FASTS challenges the political parties to confront the problem, and we request of any future Government a comprehensive plan that will address the following issues: Australia

lia must identify key technologies that we need to have in place for the 21st century; plan for these, and invest in them. These industries must reflect both our national priorities and our comparative advantages. Australia should become one of the leading technological nations of the world.

Other objectives arise from this goal:

adding value to our natural resources — food processing, fibre processing, minerals processing, new materials, clean and efficient energy;

our environment — clean, natural products — fish caught in clean oceans, grains, meat, fruit and vegetables with minimal industrial residue — and healthy leisure and tourism facilities;

our skilled workforce — education, health, science and technology services.

To develop these technologies, matching grants need to be provided by the Government to industry sources. FASTS estimates that at least \$160 million of industry money would be invested in R&D over and above existing levels, if this was matched by Government funds. This would be a start.

To be internationally competitive, Australia must invest 2.5% of the GDP in research and development. At the moment we are investing less than half of that amount. World health authorities say that Australia should be spending 2% of our national health budget on medical research. Our present level is less than 1.5%.

The national science, technology and industry priorities that we must develop span a number of Government portfolios. It is essential to strengthen the role of the Prime Minister's Science Council. Equally importantly, there must be a Minister of Cabinet rank to have responsibility for Science.

Our ability to develop technologies rests on basic science carried out largely in universities. We also need to expand greatly the number of university and TAFE graduates in science and technology. Libraries, laboratories, equipment, buildings, and maintenance funding must all be improved.

FASTS calls on all political parties to say what they will do to ensure that quality mathematics, science, and technology programmes are at the forefront of school education. It wishes to know whether, and how, the nation's scientists and technologists will be involved in contributing to a renaissance of mathematics, science, and technology programmes in Australian schools.

Ditta Bartels
President, Federation of Australian
Scientific and Technological Societies

Foundation Flora Malesiana

The second meeting of the Board of Foundation Flora Malesiana was held in Yogyakarta in September 1992. The CSIRO Division of Plant Industry is an institutional member of the Foundation, and Bryan Barlow is a member of the Board. The Board meeting was held in conjunction with the Second Flora Malesiana Symposium; and the Australian participants included Bryan Barlow, Helen Hewson, and Brian Symon (see Brian's report in the last issue of the *Newsletter*).

The Flora Malesiana Foundation has been established to try to find some way, through international co-operation, to accelerate the production of a flora inventory of the entire Malesian region, from peninsular Malaysia to Papua New Guinea. This project has been under way for about 50 years, previously being managed by the Dutch botanists based in Leiden. The sense of urgency is illustrated by the statistics indicating that at the present rate of progress with floristic inventory, it will take about 200 years to complete, while at the present rate of forest clearing, the flora may have disappeared in 20 years. The Foundation is attempting to raise funds from a variety of international sources to increase input into the project, and is co-ordinating the setting of priorities and allocation of particular parts of the work.

Bryan Barlow's role on the Board of the Foundation is perceived as extending beyond a representation of the Australian National Herbarium through the CSIRO Division of Plant Industry. His role is much more that of a co-ordinator and organizer of input from the Australian botanical community. Australian institutions can make an important contribution to the work of the Foundation, firstly through contributed flora treatments for *Flora Malesiana*, secondly through providing facilities for training of Malesian botanists and bases for them to carry out research, and thirdly in fund raising.

It would be a great help to the Foundation if Australian taxonomists were conscious of the benefits of extending any revisions that they are undertaking to take in Malesian taxa as well. For many of our projects, a simple outcome could be a relevant treatment for *Flora Malesiana* as part of the total publication effort. Bryan Barlow would be very happy to receive indications of taxa that could be covered in this way, along with time-frames for the work. He will collate these into a consolidate list, which can then be checked against the provisional priority programme for family treatments that the Foundation has established.

Because of the association of major Australian

herbaria with universities, it should be possible for us to foster postgraduate and post-doctoral work in our institutions, associated with formal training and the provision of formal qualifications. The Foundation is targeting a number of major international agencies for funds, and it is hoped that any Malesian botanists who come to work in our institutions would bring funding with them. On the other hand, finding funds to accelerate the *Flora Malesiana* programme is going to be very difficult, because of the highly competitive nature of the funding sources, and any funds that Australian institutions could raise to support the work would be most welcome.

For further details, please contact:-

Bryan Barlow

Tel (06) 246 5039 Fax (06) 246 5530

Helen Hewson

Tel (06) 250 9443 Fax (06) 250 9448

Bryan Barlow
Foundation Flora Malesiana

Workshop on Molecular Evolution

This workshop was sponsored by the United States National Science Foundation (under the U.S.-N.Z. Cooperative Science Program), and was held at the Forest Research Institute, Rotorua, New Zealand on December 12-13 1992. It was organized by Bruce Weir (North Carolina State University) and Mike Clegg (University of California at Riverside) as a satellite meeting to the International Biometrics Congress, and was designed to provide an opportunity for nine U.S. researchers in molecular evolution (Mike Clegg, Wen-Hsiung Li, Fred McMorris, Pam Soltis, David Swofford, Marcy Uyenoyama, Tandy Warnow, Michael Waterman, Bruce Weir) to meet with their N.Z. colleagues in a workshop environment.

In the final analysis, there were at least 57 people there, including five Australians and a pom. The rest of the participants represented most of the New Zealand universities, and there was a good sprinkling of postgraduate students. There were 17 talks over the two days, and the published proceedings will appear in the *New Zealand Journal of Botany* in August 1993.

Of the more interesting talks, Pam Soltis discussed the consequent difficulties of trying to get usable DNA out of fossils, and the difficulties with

contamination from the lab (e.g. bacteria and fungi); Fred McMorris talked about the problems of multiple sequence alignment, particularly the seemingly-intractable problem of equally-optimal alignments; this topic was further amplified by Ingrid Rinsma-Melchert, who concluded that the over-riding influence was of the *a priori* weights (for insertion and deletion) rather than of the alignment algorithm used; David Penny discussed the reliability (or rather, the lack of it) of evolutionary trees produced by different tree-building algorithms; David Swofford talked about computer search strategies for optimal evolutionary trees, concluding that there is no way of realistically finding the global optimum among the islands of local optima (other than by exhaustive enumeration); and Mike Clegg discussed his world-record attempt to analyze the history of avocado domestication — he used the maximum likelihood program (DNAML) in the Phylip computer package to produce a tree for 79 taxa, with the analysis taking 51 hours of CPU time on a Cray supercomputer!

A Maori concert and Hangi was held on the Saturday night, which was much better than the usual commercialized presentation of "native culture" that hardened travellers have become used to around the world. For the locals, it clearly brought back memories of their school days, as Maori culture is incorporated into their school activities in a way that so far seems to have been unthinkable for Aboriginal culture in Australian education. The Anglo-Saxon invaders clearly have a relationship with the indigenous people that has not been achieved anywhere else on this planet.

David Morrison
Department of Applied Biology
University of Technology, Sydney

Forum on Phylogenetic Methodology

This forum was sponsored by the School of Mathematical & Information Sciences and the Faculty of Science of Massey University, and was held at this University, Palmerston North, New Zealand on December 15-18 1992. It was organized by Mike Hendy and Mike Charleston as an opportunity for small-group discussion and presentation following the Workshop in Rotorua (discussed above). Many of the participants from the Workshop attended, including several of the for-

eigners (David Blair, Wen-Hsiung Li, Fred McMorris, David Morrison, David Swofford, Marcy Uyenoyama, Tandy Warnow, Georg Weiller).

There was no formal pre-arranged programme, and an informal series of sessions was organized by consensus among the participants. So, Mike Hendy talked (at length) about his and David Penny's development of spectral analysis and the closest-tree algorithm, which look very much like subsuming all alternative variants of tree-building techniques for molecular sequence data; Fred McMorris talked about all of the innumerable alternatives for producing consensus trees; Wen-Hsiung Li and Mike Steel talked about phylogenetic invariants; David Swofford showed us the latest version of the MacClade computer program; and Georg Weiller showed us his new program for interactive analysis of sequences.

However, the main objective of the exercise was to give everyone the opportunity to talk to the others about any topic that they cared to raise. This objective was facilitated by the University's staff club, which was conveniently located just opposite the Mathematics building. The University itself was originated as an agricultural university, and the staff club is the original homestead of the farm that was purchased for the University grounds. This extensive building is right on the edge of the hill that overlooks the city, and is surrounded by an elegant English garden. The lawn and the stone terrace are liberally festooned with tables and umbrellas, strategically placed to enjoy the sunshine and the view, and the fridge full of beer is only a few steps away.

So, each day began with a quiet stroll through the leafy university grounds down to the staff club for breakfast. This was followed by a rigorous session where someone tried to explain some abstruse mathematical concept to the rest of us, with much waving of the hands and despairing looks. When the concept had finally sunk in, we adjourned to the staff club for lunch. Those people who made it back from lunch were subjected to another rigorous session of mathematics, while those who didn't had to endure an even more rigorous discussion of baseball and/or politics on the terrace of the staff club.

The evenings we had off. These evenings included a reception in the staff club, a trip to the local Globe Theatre for a musical of Ellie Greenwich's early 60s songs, and an evening of excellent blues music from David Swofford on piano and Peter Lockhart on just about everything else — Peter also provided the dinner that night. Later in

the evenings, Drs Blair, McMorris, Morrison and Weiller repaired to Dr Morrison's room to consume a wee dram of the excellent Islay malt that Dr Blair had managed to pick up in the duty-free shop at Brisbane airport. One afternoon, most of also went to the Mt Bruce National Wildlife Centre to look at the local birds and wetlands, with a side trip to a brewery on the way home; everyone else spent that day at the wineries at Martinborough.

This was far-and-away the most pleasant meeting that I have ever been to. Not surprisingly, it was also the most productive — as one person commented, we learnt more on any one day there than we did on the two days at Rotorua. If more meetings were organized like this then biology would have made a lot more progress than it has.

Since I was in New Zealand anyway, I also hired a car while I was there, and had a look around for a few days — this part constitutes a holiday. And to cap it all off, my plane ticket was upgraded to business class on the way over — it sure beats walking.

David Morrison
Department of Applied Biology
University of Technology, Sydney

A.S.B.S. Melbourne Chapter

A.S.B.S. Melbourne Chapter seminars are held at 6 pm on the first Monday of each month.

They are held at the National Herbarium of Victoria, corner of Birdwood Ave and Dallas Brooks Dve, South Yarra.

Refreshments are available from 5.30 pm. All members and visitors are welcome.

Seminar Programme, March–July 1993

Monday, March 1

Tom May

National Herbarium of Victoria

"Classification and identification of species which lack distinguishing characters — focusing on *Laccaria* (Fungi)"

Monday, April 5

Michael Bayly

School of Botany,

University of Melbourne

"Cladistics and biogeography of *Eriostemon* (Rutaceae)"

Monday, May 3

Trevor Whiffin
Department of Botany,
La Trobe University

"Development of a computer-based key to Australian tropical rainforest trees"

Monday, June 3

Philip Moors
Royal Botanic Gardens Melbourne

"Beyond the Roaring Forties: New Zealand's sub-antarctic islands"

Monday, July 5

Bill Molyneux
Australflora Nursery

"An indirect road to botany"

Further information can be obtained from me on (03) 655-2313.

Tim Entwisle
Convener

The Council of Heads of Australian Herbaria Herbarium Technicians Workshop

**National Herbarium of New South
Wales, Royal Botanic Gardens,
Sydney
24th-28th August 1992**

The CHAH Herbarium Technicians Workshop is a biennial event hosted by herbaria around Australia. To date it has been held at BRI (1988), AD (1990) and now NSW. Seven technicians from the Australian National Botanic Gardens were able to attend. Other technicians from AD, BRI, CANB, CHR, DNA, MEL, MELU, NSW, PERTH, QRS, University of Western Sydney Herbarium, and WELT also attended.

ANBG participants agreed that the Workshop was a success. From the beginning it was obvious that many people at NSW had spent many hours organizing and working towards making it so. Many thanks are due to those people, and in particular David Bedford, Barry Conn, and Anna-Louise Quirico.

The Workshop covered many topics of relevance to herbarium workers and provided an insight into all of the workings of NSW, with ses-

sions covering conservation materials used for mounting specimens (paper products, tapes, adhesives, etc.), herbarium pests and their control, the volunteer specimen mounting programme, loans procedures, specimen collecting for the herbarium and living collections, photography, the scanning electron microscope, systematics, the International Code of Botanical Nomenclature, pollen analysis, the DELTA system, and pronunciation of botanical names, as well as sessions where NSW staff spoke about some of their research (e.g. *Eucalyptus*, ferns, Scrophulariaceae, water-lilies, *Westringia*, and *Xyris*). We were also shown around the Royal Botanic Gardens Sydney, the Sydney Tropical Centre, and the Mount Annan Botanic Gardens.

Criticism of the Workshop was minor, and is limited to there being simply not enough time for participants to engage in much discussion after a talk. The half hour allocated to speakers proved to be too limiting in many cases, with speakers often running over time or being cut short. There needed to be more time available for participants to speak about their own institutional practices, and then to exchange ideas and information. However, morning and afternoon tea and dinner allowed for much discussion and debate.

The value of getting together with those other people who do the same work cannot be overstated. The Workshop is really the only opportunity to meet our opposite numbers and discuss the ways in which our work is done. The Workshop generated much discussion about how things are done, why things are done in a particular way, and how to improve what is done. We returned to CBG with renewed enthusiasm and ideas on how to improve what we do!

Andrew Lyne, Corinna Broers,
Faye Davies, Wendy Dossetor,
Helen Hadobas, Susan Walker,
and Paul Ziesing
Australian National Botanic Gardens

Southern Temperate Ecosystems: Origin and Diversification conference

If you are intrigued by the puzzle of closely related plants living in pockets of land separated by the vast southern oceans, then this was a meeting for you.

Ever since Joseph Hooker first raised this enigma in the introduction to his *Flora Novae-Zelandiae* 150 years ago, systematists and ecologists have sought to explain the intriguing biogeographic pattern, invoking land bridges, sunken continents, migratory birds, continental drift and even an expanding earth. Since then, many advances have been made in our understanding of southern biogeography. Today we accept that the southern continents were once joined in one super-continent, and the vicariance caused by the breakup of Gondwana explains much of Hooker's enigma.

However, in some ways we have progressed little since Hooker's time. Most of the details, as well as much of the big picture, remain unexplained. Few biologists today have Hooker's global perspective of distributional patterns gained through direct experience. Moreover, the Hobart conference made it clear that there is still little agreement about biogeographic processes and the consequent assumptions (if any) made in explaining the distributional patterns. The lack of extant vegetation in Antarctica, which was the very core of Gondwana, leaves a glaring and permanent hole in our knowledge, and we must rely on those few fossils that may be eeked out of an inaccessible and hostile continent, even if some are amazingly good.

Four symposia comprised the conference: "Ecology and sustainability of southern temperate ecosystems", "Conifer evolution and ecology in the southern hemisphere", "Biology of *Nothofagus*-dominated ecosystems", and "Evolution and biogeography in the southern hemisphere". These reflected the interests of the three sponsoring organisations: ASBS, the Ecological Society of Australia, and Southern Connection.

The last is a group that arose out of a recent meeting in Hawaii, with the aim of fostering research on the biology of southern continents because biologists are thin on the ground there, and to provide those few biologists with opportunities to communicate. Thus the southern connection is twofold: biological and human. Bob Hill has been producing the *Southern Connection Newsletter*, which no doubt many of you have been seeing.

Bob also organised the meeting in Hobart, and its high attendance (200) and smooth running were great credit to him. The subject matter of the meeting largely reflected Bob's own interests, and for me personally, it was good to see so many botanists together in one place. However, zoologists and geologists attended too, and a public lecture by

Michael Archer on recent finds of early mammal fossils in Argentina was a highlight.

An organisational plus was the sponsoring of many delegates to attend. Most of these came from southern American and southern African countries, where science is not well supported. ASBS assisted Jeremy Midgely from South Africa, Mary Kalin Arroyo from Chile, and Irma Gamundi de Amos from Argentina. Also, there was a huge contingent of Kiwis, the most I have ever seen in one place this side of the Tasman, except perhaps at a Manly rugby league match. Rubbing shoulders with colleagues from the far-flung southern countries was one of the highlights of the conference, and I shall look forward to future Southern Connection meetings. The next one will be held in Valdivia, Chile, in 1995, and I for one will be trying to attend. Meanwhile, I shall have to persuade my Ph.D. student to teach me Spanish.

The main emphases of the conference were ecology, botany, and palaeontology. In such a large meeting, there were inevitably concurrent sessions, and I attended those with a systematic theme. For instance, I am unable to report on the "Ecology and sustainability" sessions.

Papers were the usual conference mixture, from "just-so" stories to outstanding original contributions, many of the latter from students and young scientists, and too many of the former from established professionals. Some palaeontologists produced outstanding new fossils, beautifully prepared and presented, but they appeared unsure how to synthesize their data into a cogent systematic or biogeographic hypothesis. In particular, there is still a tendency to reconstruct evolutionary history just from the stratigraphic sequence of fossils at a particular place, rather than using all of the data, both extant and extinct, to reconstruct a phylogeny of a taxonomic group before inferring historical and biogeographic patterns and processes. However, there were honourable exceptions, such as recent work on *Nothofagus* (see below).

A succession of illegible pollen diagrams left some of us groaning. There was some interesting stuff on the ecology of *Nothofagus* and conifer-dominated forests, including lots of palaeoecology, but the palaeosystematics was mostly disappointing. I was delighted when Bob Hill and Mary Dettman presented a cladogram of *Nothofagus*, including both fossil and extant taxa, based on macromorphology. It was congruent with the recent classification using pollen morphology (rather surprisingly; because pollen characters are notoriously homoplasious): in particular the subgenera were supported. Deciduousness was shown

to be badly homoplasious, perhaps unsurprisingly, except that this trait is always accompanied by a distinctive fan-like folding of the leaf in bud. The biogeography based on this looked reasonable, too.

Although vicariance has explained biogeographic patterns across the oceans in many groups, such as the Proteaceae, some contributors came up with compelling evidence for trans-oceanic dispersal events. A big problem with invoking dispersal explanations is the inherently stochastic nature of such events: they are rare, and thus very difficult to investigate, and they probably involve many different mechanisms. Gary Nelson described dispersalist biogeography as "a science of the improbable, the rare, the mysterious and the miraculous". Darwin nearly went mad trying to explain biogeographic patterns this way. Evidence for dispersal is thus largely circumstantial and untestable.

However, set against a reliable phylogenetic framework, such explanations can gain some weight. For example, Phil Garnock-Jones showed that species of *Hebe* occurring in the South American region had all their relatives, both close and distant, in Australasia. Either *Hebe* reached South America very recently, or the group is incredibly ancient, pre-dates the breakup of Gondwana, and has nearly been lost from South America while diversifying extensively in New Zealand. The former seems more likely.

Mike Pole presented an impressive mid-Tertiary macrofossil record including eucalypts and acacias from New Zealand. He argued strongly that they crossed the Tasman from Australia, and only persisted in Kiwi-land for a few million years while the climate was sufficiently warm and dry. In her Nancy Burbidge Memorial Lecture, Elizabeth Truswell also suggested that there has been

more interchange between continents than would be expected under the vicariance paradigm. Her paper will be published in *Australian Systematic Botany*, and her abstract appears elsewhere in this *Newsletter*.

Apart from Hill and Dettman's offering, phylogenetic systematics (cladistics) was confined to one half-day session. Peter Weston and I presented a wholly cladistic-vicariance explanation of trans-Pacific patterns in the waratahs and *Lomatia*. Especially good papers in that session were given by Peter Linder and Phil Garnock-Jones. Phil presented a superb analysis of the *Hebe* group, and drew some surprising biogeographic conclusions, as mentioned above. Peter did an analysis of adaptations on a cladogram of South African Restionaceae. David Bedford showed an interesting unreduced area cladogram of continental Australia, based on *Xanthorrhoea*. I was disappointed at the chorus of cheers when one speaker got up and said that she would not be presenting a cladogram of her group — revenge of the palynologists, perhaps?

ASBS has a long history of running symposia with the theme of "origin and evolution" of the biota of a major region, usually in conjunction with the ecologists. I find such meetings very valuable, for they coax we systematists out of our herbaria and into the big picture. The Hobart meeting certainly produced this effect. I now look forward to publication of the proceedings. Neil Enright and Bob Hill are editing a book on the Conifer symposium. Papers from the symposia on *Nothofagus* and "Evolution and biogeography" will be published in *Australian Systematic Botany*.

Mike Crisp
Division of Botany and Zoology
Australian National University

DETERMINAVIT SLIPS

CSIRO - BAVARIAN
CLUNIES ROSS STREET
BLACK MOUNTAIN
ACT 2601

We have observed that herbaria are interesting places because they are populated by human beings. Apparently, the people outside are rather similar. CANB has previously been referred to as the "CSIRO Hibernian", but this particular geographical anomaly is more serious. It was supplied by Brendan Lepschi.

REVIEWS

Plant Taxonomy: The Systematic Evaluation of Comparative Data.

By Tod F. Stuessy. Columbia University Press, New York. 1990. xvii+514 pp. ISBN 0-231-06784-4. \$100.

This review concludes the series started in earlier issues of the *Newsletter* (70: 30-33, 71: 32-36, 72: 24-27), assessing the ability of the current crop of plant taxonomy textbooks to present systematics as an exciting modern science, rather than as simply a traditional scholarly exercise. Therefore, I am interested in their ability to present taxonomy as a search for general truths based on explicitly-stated testable hypotheses, rather than simply as the acceptance of pragmatic solutions that are not too inconvenient.

This particular book is explicitly aimed at university undergraduate and postgraduate students undertaking a subject covering plant systematics. It would thus be completely unsuitable for the general public, as it assumes a fair knowledge of introductory biology. It is concerned with the "philosophical and theoretical aspects of plant taxonomy" rather than the practical parts, and so there is no mention of identification techniques, there are no family descriptions, and there is no list of terminology.

The book is organized into 25 chapters in two parts (Principles of Taxonomy, Taxonomic Data) and five sections (The Meaning of Classification, Different Approaches to Biological Classification, Concepts of Categories, all in Part One; Types of Data, Handling of Data, both in Part Two), plus an Epilogue. The publication quality is generally good, with typographical errors relatively rare (although Table 25.1 needs some considerable help). The text is broken up with numerous tables and figures, either providing an overview of topics not covered in the text or providing specific examples of techniques. The subject index is relatively poor, covering major subject headings only, although there are separate taxon and author indexes. The bibliography covers just over 2,900 references, mostly from the period 1968-1986, and the illustrative examples are fairly cosmopolitan, covering all continents but focussing on North America (where Ohio gets more mentions than its intrinsic interest warrants).

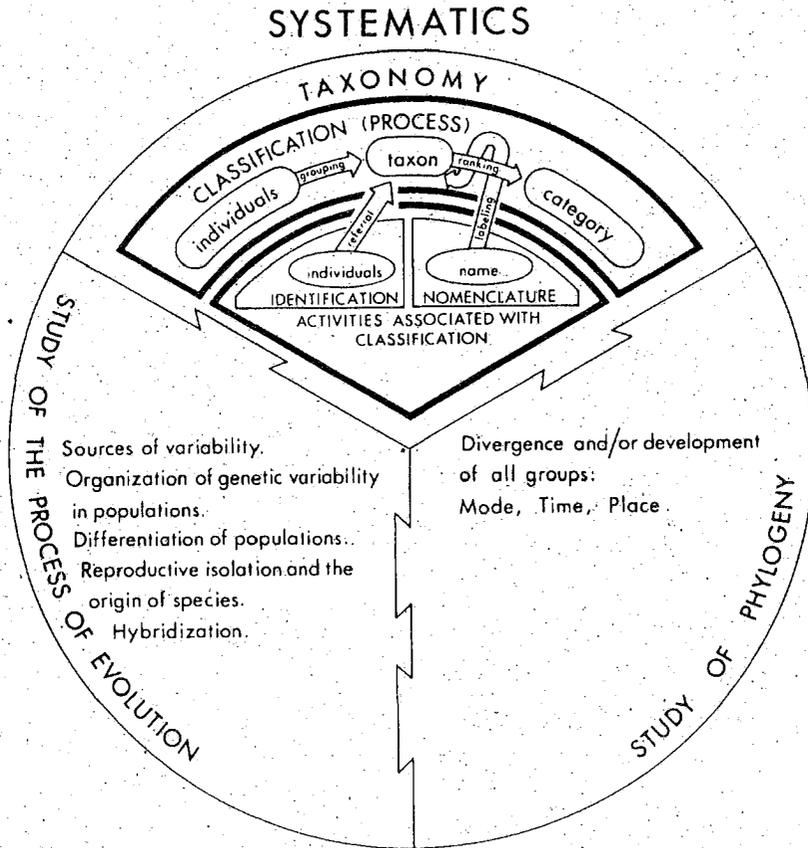
In writing this book Stuessy has set himself a

big task, as he unambiguously sets out to provide a replacement for Davis & Heywood's *Principles of Angiosperm Taxonomy* (1963), claiming that the recent books by Radford, Sivarajan, and Stace (reviewed earlier) "lack the detail of coverage of most topics". Indeed, the most-cited reference in the early chapters is in fact Davis & Heywood's book, and Stuessy by and large makes a pretty good fist of updating it. This is certainly the best exposition of the principles of systematics in any of the books reviewed, and it is far more readable than the similar book by Sivarajan. However, the trade-off is that the practice of systematics (e.g. nomenclature, identification) is largely ignored.

In many ways this book is a successful attempt to present systematics as a science — Stuessy certainly has a grasp of his subject, and he has clearly thought long and hard about where it has been and where it is going. The intellectual debates are presented as fresh and stimulating, and the revolutions that have occurred in the last 40 years are seen as having advanced systematics several light years from the old-world attitudes of the first half of this century. Indeed, comments such as the following by leading systematists are given short shrift: "I would suggest that instead of having further conferences of this kind to discuss taxonomic philosophies, that we forget about taxonomic philosophy and go back to doing taxonomy." Such an appeal for the dark ages of stamp collecting has little relevance for systematics today.

Unfortunately, each chapter in the book ends with recommendations for current taxonomic practice, all of which imply that the changes are now over and that we can now settle down into a new complacency. In other words, systematics need progress no further. This may not be Stuessy's intention, and if so then it is a flaw in the organization of the book. It would have been nice, however, to be left with a feeling that there are new horizons to reach for, and that a new generation of taxonomists would be attracted to the work because of its intrinsic fascination rather than because it's a cosy refuge from the world.

Furthermore, in the process of providing a detailed discussion of taxonomic principles, Stuessy inevitably (and quite consciously) comes down in favour of particular approaches to taxonomy as a scientific exercise. In particular, he is an ardent supporter of phyletic (or evolutionary) taxonomy, rather than of cladistic or phenetic taxon-

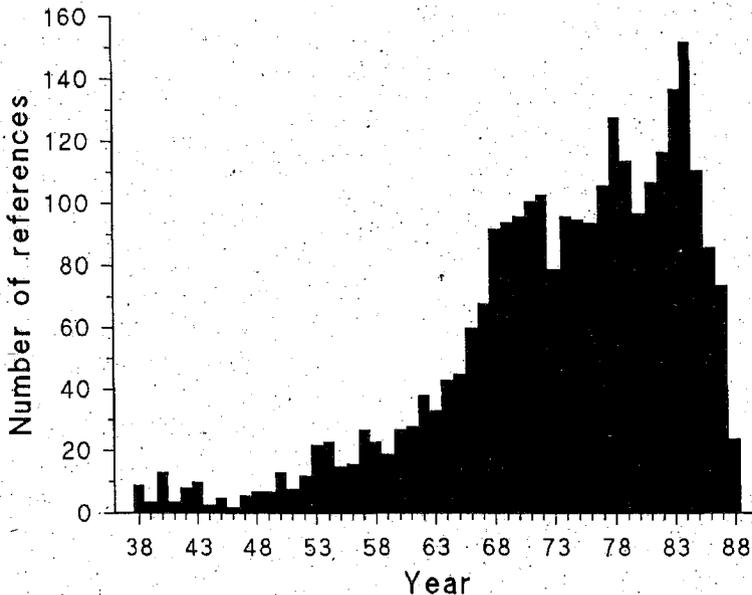


The tri-partite nature of systematics. From Stuessy (1990).

omy. This needs to be made clear, because such a viewpoint unavoidably colours almost everything in the book, and the book will therefore continually annoy anyone who disagrees with this stance. This is not necessarily a bad thing, because science (in practice) is basically one long argument between competing points-of-view, each of which has adherents who seek to express their ideas as convincingly as possible. However, Stuessy's attempts at "a balanced presentation" of alternative philosophies are not always successful, although he is to be commended for his laudable attempts to make it clear when he is expressing a personal opinion. Unfortunately, most of the summary and conclusion sections for each chapter are biased by personal opinions, and this is not necessarily obvious to the uninitiated.

This bias in view-point is compounded by the

fact that the book is more out-of-date than its publication date would suggest. The cut-off date for new literature additions is stated in the Preface to be mid-1988, and yet the peak of the bibliographic citations is 1983-84 (see graph). This means that the coverage of topics like cladistics and genomic sequencing are quite out-of-date, and this seriously limits the utility (and fairness) of the discussions. It is also interesting to note from the graph that there are actually three peaks of reference citations, 1971-72, 1978-79 and 1983-84, although it seems unlikely that this should coincide with the appearance of important papers in the literature. The dip of citations in 1973 (a drop of 20% compared to the years either side of it) also seems odd, presumably telling us more about the behaviour of Tod Stuessy at that time than of botanists in general.



Frequency histogram of the references from 1938 onwards cited by Stuessy (1990). There are citations for a further 200 pre-1938 references.

Stuessy's personal opinions also creep into the illustrative examples. The author index reveals that he cites his own work twice as often as his nearest rival (Vernon Heywood), which is perhaps going a bit too far even allowing for a normal degree of pride in one's own work. Stuessy also favours the use of the older (and less consistent) family names, unlike any of the other authors reviewed. Indeed, he several times points out that he is using older and/or less appropriate terminology simply because it "has been used extensively in the literature", and at least once he uses terms in ways that blatantly contradict their traditional usage in other disciplines (while complaining about other people doing the same thing to biological terms). Surely the best way to get rid of inappropriate (and therefore confusing) terminology is to eliminate it from the textbooks, so that the next generation of taxonomists is not handicapped by it?

The book starts with A Few Definitions (9 pages), which sets the scene for Part One. Unfortunately, the scene is not all good. Stuessy takes the nine pages to define only eight terms, doing so by providing a seemingly endless series of alternative definitions with very little attempt to synthesize them. This is symptomatic of the rest of this Part, where large amounts of seemingly irrelevant histor-

ical detail obscure the expected synthesis of concepts. This is not to imply that the historical reviews are not good, as indeed they are mostly excellent, but it is meant to suggest that a long list of unintegrated definitions (no matter how clear they are) is rather boring to read.

Chapter two, on The Relevance of Systematics (6 pages), provides some interesting views on what contributions we have made to the world, although its concentration on evolution is not necessarily strictly relevant to the focus on classification in the rest of the book. The ensuing chapters on The Importance and Universality of Classification (7 pages) and Characters (16 pages) are good introductions to their topics, although the discussion of cladistic characters suggests that "generalized vs. specialized" is synonymous with "general vs unique".

Section Two, on classification, begins with an unusually brief historical introduction, The Anatomy of Classification and the Artificial Approach (6 pages), although any more detailed coverage would perhaps simply duplicate Core's *Plant Taxonomy* (1955). The chapter on Natural and Phyletic Approaches (8 pages) covers the intuitive approaches of the last 100 years, but it tends to ignore the current practitioners of this

school, which is not helpful to the students who will encounter their works.

The chapters on the Phenetic Approach (34 pages) and the Cladistic Approach (42 pages) are far and away the longest ones in the book, indicating their influence on taxonomic principles. Unfortunately, phenetics is treated as an established technique while cladistics is treated as a newcomer, in spite of the fact that their inception was very nearly contemporaneous. This means that phenetics gets a more balanced presentation as an established discipline, while cladistics is presented as still waging a "battle" for recognition. This is mainly a product of the out-of-dateness of the references — cladistics in the last few years has rapidly become the mode of choice for the presentation of phylogenetic information. Therefore, the discussion of phenetics and its impact on systematics is very good, while that of cladistics leaves something to be desired. Nevertheless, cladistics is presented as an explicit science, which is a refreshing change from most of the other books that I have reviewed.

One of the biggest difficulties in the cladistic chapter is that Stuessy tends to treat cladistics as synonymous solely with the parsimony approach, which may have once been true but is no longer very accurate. He thus produces long discussions of material that is now irrelevant (or at least less important than it once was). For example, all cladograms are treated as necessarily being rooted, so that character polarities must be decided first, and this is treated as being a major problem. However, functional outgroup analysis can be used, where an unrooted tree is first produced using unordered characters, and then the character polarities are determined by rooting the tree with an outgroup. This possibility is treated as an aside towards the end of the chapter, whereas it is the fundamental basis of all parsimony analyses of molecular sequence data. The discussion of character polarities is thus nothing more than a long self-justification for the ideas presented in the paper by Crisci & Stuessy (1980), which moves well outside generally-accepted cladistic practice.

The balance of topics is less than felicitous elsewhere in the chapter, as well. For example, the longest section is on clique techniques (which are rarely used these days), while distance tree techniques and maximum likelihood techniques are hardly mentioned at all. The discussion of the efficacy of the tree-building algorithms is thus rather weak. A better framework for this section would be to compare the likelihood that the model on which each algorithm is based is in fact real. No

technique in science will ever be a final answer, and therefore we must make conscious decisions about what aspects of reality we are trying to incorporate into our reconstruction of the world.

The section on cladistic classification is also rather brief and inaccurate. The comment is made that "paraphyletic groups to some cladists are not useful for classification", which seems to be a little disingenuous, since most cladists seem to accept this. The argument for accepting paraphyletic groups is based on the use of both patristic (degree of divergence) and cladistic (branching pattern) information. If the patristic data are included, then some of the descendants of an ancestor may be placed in a separate group in the classification (because they have diverged sufficiently from the other descendants), leaving the remainder of the descendants as a paraphyletic group. This classification will then contain more information (patristic + cladistic) than the equivalent purely cladistic one. However, the point is not which classification contains more information, but which one allows you to retrieve that information. A cladistic classification allows you to retrieve all of the cladistic information that has gone into it, but the alternative classification does not allow you to retrieve *any* information, since you don't know whether any one part of the classification was based on the patristic or the cladistic information. Consequently, it is difficult to be a cladist and to accept paraphyletic groups at the same time.

It is also worth noting that not all of the branching pattern needs necessarily to be incorporated into the classification, as implied by Stuessy. Thus, not all of the dichotomies of the cladogram have to represent groups in the classification; however, all groups in the classification should represent a branch on the cladogram. Similarly, parts of the cladogram that are not fully resolved into dichotomous branches allow the formation of so-called metaphyletic groups, which are not resolvable into either monophyletic or paraphyletic groups given the current data set.

The assessment of the impact of cladistics on taxonomy is marred by a confusion of phylogeny and classification. Cladistics is a method of reconstructing the phylogeny of a group of organisms, and this phylogeny may (or may not) then be used to construct a classification. Consequently, cladistics produces an explicitly-stated and testable hypothesis concerning the *phylogeny* — it does not produce a testable *classification*, as claimed by Stuessy. The production of a classification is thus a by-product of the phylogeny, rather than an integral part of it (other potential by-products include the

analysis of evolutionary patterns and the analysis of biogeography). This same confusion of trees and classifications carries over into the next chapter as well, to its considerable detriment. Stuessy also, strangely enough, considers that cladistic analysis is "most useful" at the specific and generic levels, although there is no clear justification for this conclusion.

The final chapter in this section, Evaluation of the Three Major Approaches: The New Phyletics (19 pages), is an attempt to synthesize the best bits of the phenetic, cladistic, and phyletic approaches to classification. As far as I can make out, the New Phyletics is something like a cladistics analysis where plesiomorphies turn out to be useful after all. Unfortunately, determining precisely when these plesiomorphies are useful does not appear to be able to be made explicit, thus leaving a very large subjective component in an otherwise laudable attempt to be objective.

However, one of the main justifications for the New Phyletics is that the resulting classifications contain more information (patristic + cladistic, as discussed above), and so they suffer the problem of inadequate information retrieval. They are thus *less* predictive than the equivalent cladistic classification, not *more* predictive as claimed by Stuessy. Phyletics is also claimed to have more "efficiency" when producing classifications compared to cladistics, although this concept is equated solely with the speed of intuitive judgements. This is like preferring Newton's equations for planetary motion to those of Einstein — they produce answers faster, even if these answers are known to be inaccurate. Much is also made in this chapter of the number of characters used to construct classifications (more is better), but it is clear that it is the *congruence* of the characters rather than their quantity that is responsible for the stability of the resulting classifications.

Unfortunately, Stuessy's attempt to produce a new science of taxonomy are thus weakened because he apparently cannot give up the traditional aesthetic subjective judgements that he presumably learnt to use during his own training. His comment that "the majority of practicing taxonomists, despite the furor of past decades over phenetics and cladistics, still make classifications phyletically" is more a reflection of the general demographic aging of the taxonomic population than a justification for current taxonomic practice. The New Phyletics thus turns out to be a way for traditional taxonomists to pretend that they are keeping up-to-date without actually changing their behaviour in any substantive way. This chapter is there-

fore the weakest part of the book by far.

The third section covers the categories used in taxonomy. It begins with The Taxonomic Hierarchy (5 pages), followed by chapters on Species (21 pages), Subspecies, Variety and Form (12 pages), Genus (13 pages), and Family and Higher Categories (7 pages). Each chapter starts with an historical overview, followed by a discussion of relevant points, ending with a recommendation for usage. Most of the discussion is very good, but there are a number of points where issue can be taken. For example, Stuessy suggests that classifications based on ordination analyses do not have the "predictive characteristics of classes that result from hierarchical classification". However, this will not be true if evolution is reticulate, as he claims elsewhere in the book (dichotomous speciation is referred to as "a most dubious assumption") — under these circumstances then ordinations will be *more* predictive.

The discussion of species is suitably detailed given the amount of time that biologists have devoted to the concept, but it is marred by loose thinking in places. For example, the discussion of whether species are classes or individuals shows considerable confusion of transformational versus variational evolution (Charles Darwin's contribution to biology was to point out that individuals undergo *transformational* evolution while classes undergo *variational* evolution). Furthermore, the chapter ends with a recommendation for using the biological species concept, which is at odds with the claim that species "have evolutionary reality". As Ernst Mayr has repeatedly pointed out, the biological species concept is atemporal, and thus has no evolutionary derivation. Its use in a phylogenetic context is thus meaningless, and it is therefore of doubtful utility if the taxonomic hierarchy is to reflect phylogeny. The biological species concept is also different depending on whether it is defined in a negative manner (species do not interbreed with each other) or in a positive manner (species are collections of interbreeding populations) — biological species are thus units of convenience based on pragmatism.

The discussion of genera is another area that suffers from out-of-date references, notably in the claim that "only a few studies so far of plant groups have dealt with determining generic limits using cladistics". Stuessy disparagingly refers to the "dogmatic cladistic view" that regards genera as natural only if they are based on synapomorphies, preferring to give formal taxonomic recognition to groups that are "conservative in size and shape of certain features reflecting clear morphological dis-

continuities". At the higher taxonomic levels he also refers to "the evolutionary value of paraphyletic groups", although he never presents any "value" other than pragmatic utility. He also misrepresents the arguments about the paraphyletic nature of monotypic genera, since their sister groups are not necessarily paraphyletic.

Part Two of the book discusses taxonomic data. This part has no real explanation of the terminology used (unlike Part One), and there is no systematic survey. It is mainly a brief introduction to each of the types of data used by taxonomists, with comprehensive references to other works that provide more details, followed by many illustrative examples of their uses and usefulness in classification. It covers Morphology (15 pages), Anatomy (18 pages), Embryology (16 pages), Palynology (21 pages), Cytology (25 pages), Genetics and Cytogenetics (16 pages), Chemistry (22 pages), Reproductive Biology (13 pages), and Ecology (16 pages), the relative chapter lengths accurately reflecting the amount of detail presented.

However, the arrangement of the information among the chapters is not always reasonable. For example, the discussion of DNA sequencing is in the chapter on chemistry, while allozymes are discussed in the chapter on genetics. The argument presented for this arrangement is an example of the out-of-date nature of a number of the concepts in this section. This is highlighted by the extremely inadequate nature of the description of DNA sequencing techniques, with polymerase chain reactions not even being mentioned. Furthermore, Stuessy tries to convince us that "phenetic algorithms are best [for] base pair sequence data", which must come as a shock to those of you who have been happily doing cladistic analyses on these data for years. His discussion of the utility of cytogenetics in cladistic analyses is also very confused, because he fails to acknowledge that cladistics deals only with cladistic information not with patristic information (knowledge of inter-taxon crossability is useful for the latter but not for the former).

The chapter on ecology also has a few minor inadequacies. Stuessy manages to list several works on plant population ecology without reference to Harper's *Population Biology of Plants* (1977) or to Silvertown's *Introduction to Plant Population Ecology* (1987); and Greig-Smith's *Quantitative Plant Ecology* (1983) is also ignored completely. He also reproduces what looks like the most outrageous vegetation map of the world that I have ever seen (the entire east coast of Australia is occupied by "Temperate rain forests", in spite of

the fact that "Sclerophyllous vegetation" is also a map unit); and he suggests that hybridization between introduced weeds and native plants is not "natural" (thus ignoring the dynamic nature of the relationships between species). His (brief) discussion of biogeography also presents the vicariance versus dispersal debate as a discussion of "whether one or the other is the all-inclusive general explanation" rather than a discussion of whether one or the other produces testable hypotheses explaining plant distribution. The same confusion mars the equally-brief discussion in the chapter on cladistics, where dispersal is referred to as "non-informative" rather than "untestable".

The book ends with two practical chapters on Gathering of Data (8 pages) and Presentation of Data (15 pages), which are unique to this book among all of those reviewed. These chapters open up a whole new area of offering advice on the practical aspects of being a taxonomist, which could be usefully expanded into a book in its own right. However, I don't think that I'd recommend Sokal & Rohlf's *Biometry* (1981) as a "starter" for data analysis, as it is too detailed; perhaps their *Introduction to Biostatistics* (1988) would be more appropriate.

All in all, I enjoyed this book, in spite of my criticisms. This is partly because Stuessy has presented enough of each concept to stimulate debate while having the forthrightness to make his own opinions clear, and partly because it avoids most of the "boring" bits of taxonomy. However, I can't help being disappointed with the conservative nature of the pragmatism that creeps into all of the conclusions that are reached. In the final analysis, the book is Stuessy's *magnum opus*, where he provides a justification for the attitudes that he holds and the work that he has done. As a university textbook, therefore, it has serious flaws, because it still points towards the recent past rather than the recent future. Anyone who is determined to play an active part in the future development of systematics will thus find this book very annoying, since it has the overall flavour of a current pause in progress rather than of a continuing advance.

So, what conclusions can I come to about all of the books reviewed in this series? The book by Charles Jeffrey is the most "traditional" of them all, concentrating on nomenclature rather than on principles, although it is in the process of being usefully updated. The book by Clive Stace has rather too much of a hangover from the interest in biosystematics that grew in the 1960s and 1970s, and rather too little about modern principles. The book

by Samuel Jones & Arlene Luchsinger is the most readable general introduction to taxonomic principles and especially practice, but its almost exclusive focus on American plants means that at least half of the book is of dubious value. The book by Albert Radford is far and away the best compendium of taxonomic principles and practice, but it is almost unreadable as a textbook and so is more useful as a reference source. The book by V.V. Sivarajan is a good introduction to the principles of taxonomy, but no-one should pay good money for such poor publishing quality. Finally, the book by Tod Stuessy is the most readable introduction to the principles (but not the practice), provided you realize (and to some extent agree with) his personal viewpoint. So, if you're looking for a book to convince someone else that systematics is a modern science, then Stuessy's book comes closest to what you want, but I don't think you'll really convince anyone.

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Grevillea (Proteaceae). **A Taxonomic revision.**

By D.J. McGillivray, assisted by R.O. Makinson.
Melbourne University Press. 1993. 480 pp. ISBN
0-522-84439-1. \$225.

The name *Grevillea* commemorates Robert Greville, "a gentleman eminently distinguished for his acquirements in natural history, and to whom the botanists of this country are indebted for the introduction and successful cultivation of many rare and interesting native plants". So wrote Robert Brown when he took up Dryander's name for the genus in 1809. Nowadays, if you wish to find out more about Greville, he is better known for his role as "protector" of the lady whom he later prevailed upon to marry his uncle and become the notorious Lady Hamilton. That same uncle was reputed to have been responsible for introducing into England the process of lithography. No doubt both would be amazed at the sight of the new *Grevillea* book.

The size is large coffee-table format, with an eye-catching colour reproduction of the flowers of *G. tripartita* on the front cover. Coverage in a two-column format is of 253 species, each with a comprehensive c. 500-word description, a separate and

detailed account of the distribution of colour in the flower, flowering time, ecology, uses, reference to other illustrations, discussion of variation, and a distribution map. Identification of the species is via a key to 11 artificial groups, but the species themselves are arranged in "natural" groups concerning which there are further notes included in an appendix. The synonymy and typifications of all species is removed to a separate nomenclatural section at the back.

Illustrations of species are by excellent colour photographs, coupled with line drawings to help in interpretation. Layout has ensured that there is a map, line drawing or colour photograph on every double page, greatly adding to the overall appeal of the book. There are 65 species that are not illustrated by a line drawing or photograph; 30 of these have references to illustrations elsewhere. The other 35 species are usually only represented by a small number of collections, e.g. *G. granulosa* McGillivray, *G. rosieri* McGillivray, *G. pinifolia* Meisn., and *G. disjuncta* F. Muell.

Very seldom these days would a revision of such a large Australian genus appear without a considerable number of new species. This one officially has only one (*G. subterlineata* R. Makinson), since all of McGillivray's new names were published in 1986. It is, however, the first time that these new species (53 in all) and subspecies (34) have been described in detail. A half-sized reproduction of "New Names in *Grevillea*", the 1986 publication in which they were formalized, is included as an appendix.

The introductory chapters are brief, consisting of a short introduction, a chapter on morphology, the method for preparing descriptions, and a glossary to special terms. The seven pages on morphology have a great deal of detail for each organ of the genus, and are followed by two detailed pages on how measurements of some of these organs such as the perianth, pistil, nectary, fruit and seeds have been made.

The part of this revision that will no doubt receive the most use is the key to species, in conjunction with the glossary and the chapter on morphology. Any material that is purely vegetative or only with fruits will be impossible to identify, since the key to groups requires a knowledge of floral characters. My testing of the key was performed in two ways, the first by using the descriptions as they appear in the revision, and the second by taking a box of backlog material from AD.

From the descriptions: On the whole, by taking a species and keying it out from the written description most species of those tested appeared in all of

the groups that they should have done. However, *G. thelemanniana* should also be included in those species in the key to Group 3, and *G. argyrophylla* should be included in the key to Group 10.

From specimens: In keying out a box of backlog specimens of *Grevillea*, it was found that once one became familiar with the terminology, with the help of the glossary and the detailed morphology chapter, there were usually few problems. The inflorescence shape, often difficult to discern from dried material, probably caused the most headaches; an understanding of the term "secund" is assumed as it has not been defined in the glossary or in the descriptive characters. Either my determination was wrong or the accuracy of the distribution map for *G. juncifolia* is suspect, as a specimen that keyed out this species came from 70 miles S of Darwin, which is outside the area shown for the distribution of that species.

It should be noted that within the group keys reference is to the species number rather than the page number. As each page has the species name and species number at the top, this aids in finding the relevant species quickly.

Probably the most controversial aspect of this work is the decision not to recognize much of the infraspecific variation formally. Where there is variation, and this applies to a great many of the species, there is an extremely detailed discussion. It would appear to this reviewer, particularly where taxa have been described, mapped or keyed out (e.g. under *G. hookeriana*, *G. tetragonoloba*, *G. fasciculata*, *G. brachystylis*, *G. pityophylla*, etc., etc.), that in the interests of stability of the broad species concept adopted, it might have been preferable to formalize them. The use of multiple terms (forms, races, elements and entities) to represent these informal taxa is confusing, as is the statement on p. 399 that "informal ranks 'race' and 'form' have been used when lack of definition or paucities of difference or data have made recognition of subspecies inappropriate. In general current Australian practice, 'race' as used here is equivalent to subspecies."

The lack of any formal recognition of many infraspecific taxa has already had ramifications. *G. calliantha*, here treated as an entity of *G. hookeriana*, but described by Makinson & Olde as a separate species in 1991, is included on the list of taxa added to the *Proposed National List of Endangered Plants* (Australian Network for Plant Conservation 1993). What will happen to it now? If it reverts back to *G. hookeriana* then it is presumably no longer endangered! Wrigley (1989), in his account of *Grevillea* in *Banksias, Waratahs and*

Grevilleas, although having access to McGillivray's new names, chose to retain a number of species sunk here by McGillivray (e.g. *G. ninghanensis*, *G. rogersii*), since he considered that they "deserved separate recognition, at least horticulturally." Similarly, it is W.R. Barker's intention to continue (Barker 1989) to leave *G. rogersii* (equivalent to the "small-leaved form" of *G. lavandulacea*, and confined to the western end of Kangaroo Island) in the South Australian Census as it is counter-productive to merely sink it into the great morass of variation of the parent species.

Although I would agree with the outcomes from the nomenclature chapter, there is room for controversy. Some of the decisions made would surely have occupied the "consistent pedant" for several agonised pages of Kew's unofficial Nomenclatural Forum, and were perhaps deserving of some discussion in the introduction. These include the decision to use the term lectoparatype (or ?paralectotype), and to refer to the duplicate sheets of the lectotypes, which may or may not have been seen by the author and thus form part of the protologue, as "parts of the type collection". What, one wonders, is the annotation on the type sheet? Similarly, on p. 430 there is a rejection of the earlier name *Lysanthe podalyriifolia* Knight for *G. mucronulata* R.Br. on the basis of not being able to produce a neotype, and also so as not to "promote the principle of priority beyond its proper bounds". But what are those bounds?

I would take issue with the statement that invalid names are not mentioned as they are best forgotten. Invalid names include manuscript names, and in a work such as this, which is after all a revision of the genus, a true history of the species involved should be presented. To do this entails a consideration of all names, whether they be validly published or not. For instance, Solander, Dryander, Robert Brown, and Salisbury/Knight all worked on the same specimens, and it is often only through consideration of their manuscript names that it is possible to establish the sequence of events that led to publication and to identify those specimens that should be considered in lectotypification. Nor is it true to say that manuscript names have not been mentioned here, since they are sometimes quoted within the lectotypifications, e.g. under *G. baueri* and *G. buxifolia* ssp. *buxifolia*.

It has to be said that I did find it difficult to get an overview of the genus from the book. The appendix indicating relationships within the genus needs to be cross-referenced to the "natural" groups recognised in the text (e.g. species 1-47, *G. pteridifolia* and related species correspond to Group

1 of the appendix, species 48-52 correspond to Group 6), and it also needs considerably more information as to character states. This would perhaps have been best supplied by producing a key to the natural groups, as in the traditional conceptus.

From my point of view as part of the team responsible for revising the sister genus *Hakea*, reviewing this book has been a fascinating exercise. The terminology used differs slightly from that used for *Hakea*, a problem that will need to be overcome for the forthcoming treatment of the two genera in the *Flora of Australia*, and also for any cladistic analysis of the two genera.

In contrast to *Hakea*, where the diversity tends to be in both the flowers and the fruit, in *Grevillea*, where the fruit is usually not retained, the greatest diversification appears to be within the flowers. Colour and its distribution within the flower tends to be more variable than in *Hakea*, easily justifying the treatment of the flower colour as a separate heading at the end of each description. Black features in a number of species restricted in their distribution, e.g. *G. benthamiana* has a black perianth and *G. scortechinii* and *G. hookeriana* have black styles, and it would be interesting to know whether this has any significance in the pollination of these species.

Other parallels seen within the two genera can be found in perianth shape. Within *Hakea* there is a group in which the tepals remain coherent except along the dorsal surface. All have large red flowers and are bird pollinated. However this same coherence of the tepals within *Grevillea* seems to have arisen for a different purpose, as here the flowers are relatively small and not red. Both genera have a group of species with straight buds, Section *Manglesia* of *Grevillea* (12 spp.) and Section *Manglesioides* of *Hakea* (4 spp.); all species, with the exception of *G. anethifolia*, are confined to southern Western Australia. Pendent inflorescences are found within *G. thelemanniana* and also in *Hakea pendens*.

Within the fruit, similar excrescences and shapes are found in *Hakea rhombales* and *G. pectinata*, but no mature fruits of *Hakea* are known to produce sticky exudates as in *G. petropholoides* and other *Grevillea* species. *G. annulifera* and *G. glauca* exhibit the same round fruit with displaced apex as in *H. incrassata* and *H. platysperma*.

Vegetatively, there are also a number of parallels that can be made between the genera. *G. infecunda* resembles *H. aenigma* of Kangaroo Island and *H. pulvinifera* of New South Wales by maintaining its populations by root suckering

alone. None of them produce fruits, and their pollen is sterile. *G. banksii* and *G. pteridifolia* both have forms ranging from prostrate to small trees, just as in *H. prostrata*. Variation in leaf structure within a species is a feature of a number of species in both genera, e.g. *G. leptobotrys*, *G. ilicifolia*, and *H. varia*.

With the documentation of the variation within *Grevillea*, the time has almost arrived for a cladistic analysis of the two genera to determine whether they are each truly monophyletic.

A number of chapters that are usually features of modern revisions have obviously not been undertaken because of the health of the author. I was personally sorry to see that there was no chapter on the history of the genus, since I was very conscious that the ground trodden in preparation of the *Hakea* account had been well and truly explored previously by Don. However, the framework is now in place for studies on pollination, dispersal, reproductive biology, and evolutionary biology of the genus; and it is hoped that Bob Makinson, who has steered much of this book through its final stages, will undertake these. It is not quite clear just how much Bob's contribution has been, as the acknowledgements have all been done in first person singular, and nor am I quite sure whether the book's author should be cited as McGillivray or McGillivray & Makinson.

Not to mention the price of this book would be remiss. It may be a product of the large size, prolific use of colour and small print run, but the figure quoted seems inordinately high and more in line with that for a limited-edition work. Unfortunately, it probably puts it beyond the reach of those "interested amateurs" for which the media release says it is a must, and it certainly makes it difficult to justify more than one copy per institution where budgets are tight.

It was a great pleasure to review this book. I am sure that the whole of the botanical community, particularly within Australia and at Kew where Don was very highly regarded during his term as Australian Liaison Officer, will derive a similar sense of satisfaction to see it. Despite all the difficulties he has had to face, Don, with Bob Makinson's help, has been able to produce a magnificent tome on the grevilleas.

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The Names of Acacias of New South Wales. With a Guide to Pronunciation of Botanical Names.

By Norman Hall and L.A.S. Johnson. Royal Botanic Gardens, Sydney. 1993. 69 pp. ISBN 0-7310-0118-4. \$15.

This slim volume contains far more than an initial glance at its main title implies. It is of relevance to all of those people with an interest in botany, both professionals and non-professionals, regardless of the state in which they live.

The book is divided into two major parts, an introductory section dealing with the history of wattle's and the formation and pronunciation of their names, and a section dealing specifically with the names of all New South Wales taxa.

The first section contains a brief but comprehensive explanation of the "how and why" of the formation of botanical names, followed by a detailed exposition on the pronunciation of botanical names. The latter is the fruit of the second author's long interest in matters linguistic and nomenclatural. In the concluding paragraph, he states the "the foregoing may seem formidable at first sight", and this is indeed the case; but closer examination of the text shows that there are numerous examples that enable the reader more easily to grasp the point being made. This approach is a consistent one, but many will find, as I did, that some of their present pronunciations do not follow the traditional principles outlined here. Whether we strive to follow such guidelines or, as the writer

says, "go with the crowd and admit that many a good rule allows occasional exceptions" is up to us.

The second major section of the book lists all of the names in use at the time this book went to press (lacking only *A. bulgaensis* and *A. matthewii*, published late last year). Each entry gives binomial (or trinomial for subspecific or varietal taxa), author, common name, guide to pronunciation, and derivation of epithet, whether from a classical source, a personal name or a geographic name. In the latter cases, brief biographical or locality information is given. Although restricted in scope, this section covers such a wide range of epithets that it would be informative to any reader interested in the formation of plant names.

The book also includes a short glossary and bibliography, brief biographical notes on the authors of names in the book, and an illustrated guide to the groupings of species used in the *Flora of New South Wales*.

The book is attractively presented and production standards are high. I could find little in the way of errors or omissions, except that the treatment of subspecific and varietal taxa is somewhat inconsistent and the author of *A. leiocalyx* [(Domin) Pedley] is omitted.

In conclusion, this is a useful book that would be a valuable addition to any personal or institutional library.

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Flora of New South Wales, Volume 3.

Edited by Gwen Harden. University of NSW Press, Kensington. 1992. 717 pp. ISBN 0-86840-172-2. \$89.95.

This brief review should be largely a matter of preaching to the converted, as the *Flora of New South Wales* is shaping up as a great improvement in our understanding of the regional flora, and as a stepping stone in the direction of an adequate knowledge of plant systematics in Australia.

The volumes of the *Flora of New South Wales* have appeared in an amazingly short period of time since the inception of the project in 1982. This important volume runs from Balsaminaceae to Lamiaceae, and thus contains many sizable fami-

lies, including Apiaceae, Asteraceae, Solanaceae, Epacridaceae, Rubiaceae, and Lamiaceae.

As is perhaps inevitable with a work of this size and detail, *Volume 3* does contain a few minor shortcomings. There are a few spelling mistakes, e.g. p. xx "Nooteboon" should read "Noot-boom". There are some annoying couplets in the keys, e.g. p. 3 Polygalaceae "2 leaves always alternate ... 2* leaves alternate or occasionally ...". Some of the keys are tricky, e.g. p. 198 *Conyza*. Unsupported relationships are indicated in the Asteraceae by the placement of *Ceratogyné* (p. 289), *Centipeda* (p. 293), *Abrotanella* (p. 294), *Isoetopsis* (p. 295), and *Elachanthus* (p. 296) with the Anthemidae genera (*Eriocephalus* to *Artemisia*, pp. 284–295). This is despite some clear evidence to the contrary (see Gadek *et al.*: 1989; Bruhl & Quinn 1990, 1991; Anderberg 1991). Some of the keys are set out incorrectly, e.g. p. 419 *Monotoca* "2 *M. scoparia*" is aligned against "1* ...", but should be set against "2* ...". The statement in the glossary (p. 677) that "Kranz anatomy ... [is] found in some grasses (Poaceae) and chenopods ..." is ambiguous; Kranz anatomy also occurs in other families, e.g. in the Cyperaceae. A few of the black-and-white drawings adjacent to the text are of variable quality and usefulness; however, it is great to have every species individually illustrated.

Now for the good news. The keys generally work very well, even in the case of the large and difficult families (e.g. Asteraceae). The descriptions, together with the illustrations, work well to confirm the results of the keys. The colour photographs are generally excellent. The glossary is well-illustrated and useful, and the general quality of the volume is high. In summary, this (and its companion volumes 1 and 2) is a great tool for regional identification. It will promote a better understanding and a greater appreciation of our flora. I am looking forward with bated breath to *Volume 4* dealing with the monocots.

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-
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- Plantago. A Multidisciplinary Study.**
Edited by P.J.C. Kuiper and M. Bos-Berlin. Springer-Verlag, Berlin. 1992. 368 pp. ISBN 3540536329. \$195.

STOP PRESS

As this issue of the *Newsletter* was going to press, we were informed that the membership of the Australian Systematic Botany Society Inc. has

voted to formally accept the new Constitution. The new Constitution is therefore now in effect.

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This list will be kept up to date, and will be published in each issue.
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The Australian Systematic Botany Society is an incorporated association of over 300 people with professional or amateur interest in botany. The aim of the Society is to promote the study of plant systematics.

Membership

Membership is open to all those interested in plant systematics. Membership entitles the member to attend general meetings and chapter meetings, and to receive the *Newsletter*. Any person may become a member by forwarding the annual subscription to the treasurer. Subscriptions become due on January 1 each year.

The Newsletter

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

Contributions should be sent to one of the editors at the address given below. They should preferably be submitted as:- an unformatted word-processor or ASCII file on an MS-DOS or Macintosh diskette, accompanied by a printed copy; as an unformatted word-processor or ASCII email file, accompanied by a fax message reporting the sending of the file; or as two typed copies with double-spacing.

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

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