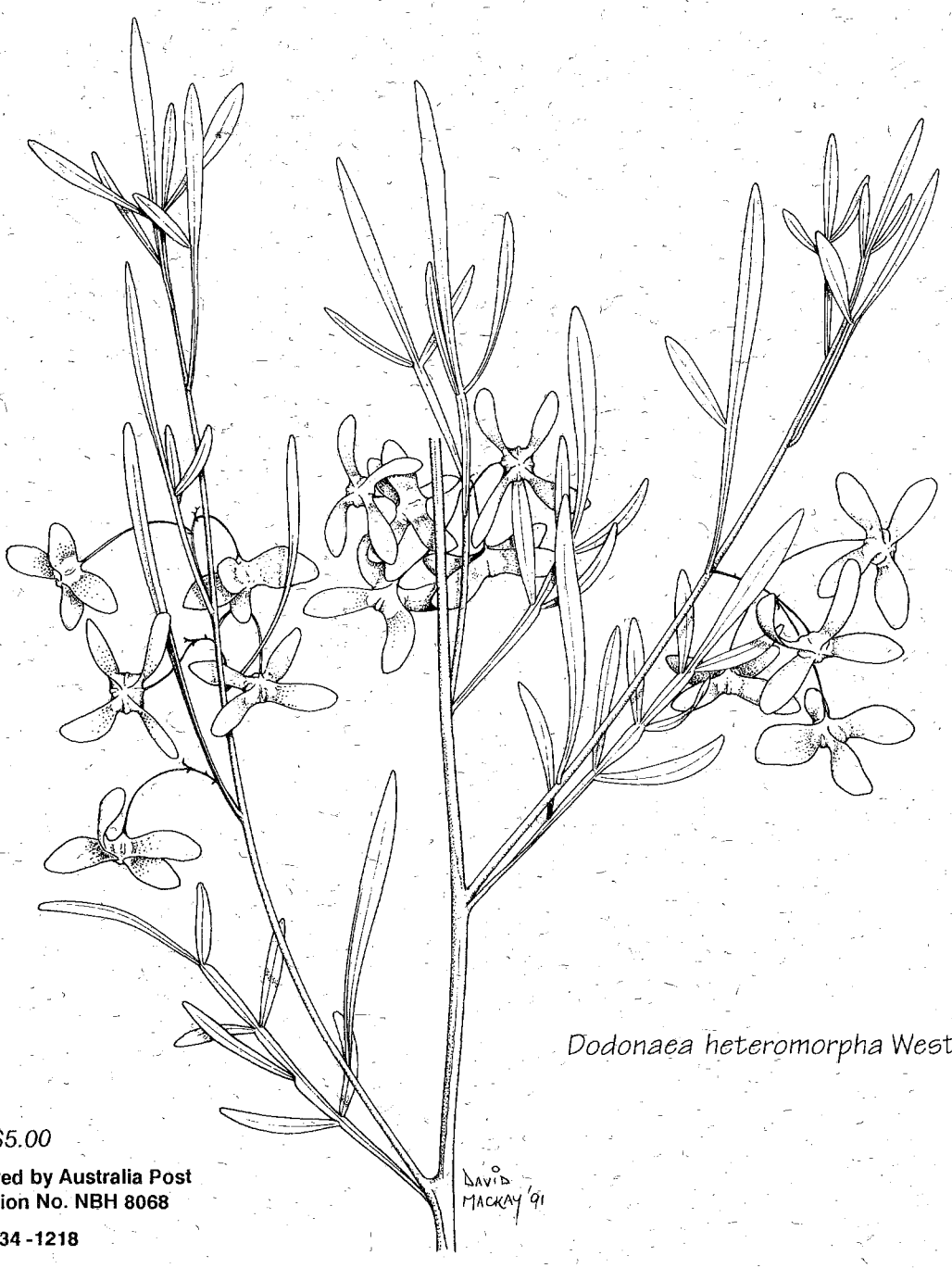
Australian Systematic Botany Society NEWSLETTER

No 69 DECEMBER 1991



Dodonaea heteromorpha West

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EDITORIAL

This issue is actually being sent out before Christmas, which makes it the earliest that we've ever completed an issue. This was achieved by simply ignoring all late contributions (except those from the council, which are always chronically late).

We have now survived a year in the editing business, and we are actually to the stage where we don't cringe when other people look at the finished product. This doesn't mean that we are necessarily pleased with the each issue, but simply that we have worked out how to produce them without sleepless nights. We do, however, definitely cringe when Barry and Judy plead to have a late contribution put in, or suddenly change their mind about an official notice.

Anyway, we'd like to thank all of those people who have contributed to the *Newsletter* over the past twelve months. The last four issues certainly haven't been any shorter than the previous ones!

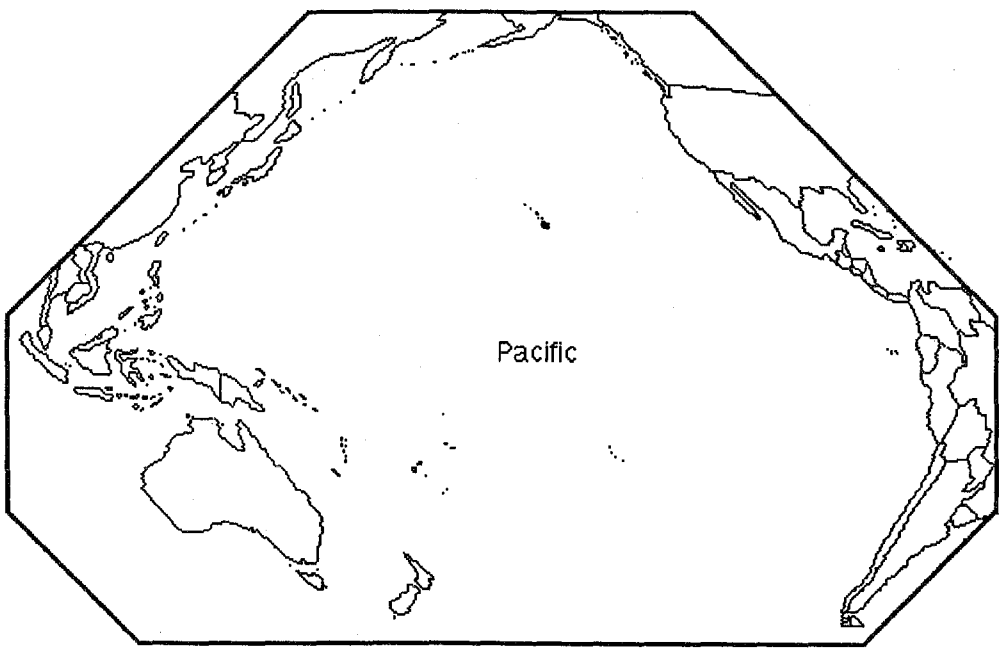
Enclosed with this issue is the first of a multi-part index to the contents of the earlier issues of the *Newsletter*. This project has been an on-going (largely voluntary) effort by many people over several years, which the current council decided to finally get to press. Naturally, they looked to their trusting editors for guidance, and we were silly enough not to look pointedly in the other direction. With any luck (and a lot of hard work), the remaining parts will appear during the coming year.

For those of you who are interested, the first quotation from Mark Twain in the last editorial (about Napoleon shooting at an editor and missing and hitting a publisher instead) is apparently a reference to the death of Johann Palm. He was a German publisher who had been printing subversive pamphlets, causing Napoleon to personally order his execution. A much earlier commentary on this incident is provided by the English poet Thomas Campbell, who gave a toast to Napoleon at an author's dinner with the words:-

I agree with you that Napoleon is a tyrant, a monster, the sworn foe of our nation. But gentlemen — he once shot a publisher!

—*Notes and Queries*

David Morrison
Barbara Wiecek



ARTICLES

Buddleja — Where is it in Australia?

Barry J. Conn and Elizabeth A. Brown
National Herbarium of New South Wales

Introduction

This largely tropical or subtropical genus occurs naturally throughout America, Africa, and Asia. A few species have been introduced into Australia, being cultivated as ornamentals. Six species appear to have become naturalized, some doubtfully. Insufficient herbarium collections mean that it is difficult to gain an understanding of the extent of naturalization for most of these species. There is an urgent need for additional observations, supported by herbarium vouchers, so that the *Flora of Australia* treatment can be completed.

We have included a key to the naturalized species, along with the known distributional data, in the hope of encouraging people to make collections of this genus. It is classified in the family Buddlejaceae or is included in the Loganiaceae.

Key

1 Inflorescence a botryoid of globose head-like flower-clusters **6. B. globosa**
1: Inflorescence paniculate, spike-like or thyrsoidal; never globose
2 Lamina of adjacent leaves joined basally **4. B. australis**
2: Lamina of adjacent leaves not joined
3 Corolla tube short, up to 1.3 times as long as lobes; stamens exserted **1. B. dysophylla**
3: Corolla tube at least 2 times as long as lobes; stamens included (sometimes just exserted)
4 Corolla white, violet or purple; anthers inserted at or below the middle of the corolla tube, included
5 Corolla tube mostly curved, purple, 12–17 mm long, 3.5-8 times as long as the calyx, with the outer surface densely glandular-pubescent; leaf lamina entire to coarsely sinuate-dentate **3. B. lindleyana**
5: Corolla tube straight, white to violet, or less often purple; 6–11.5 mm long, 2–4 times as long as the calyx, with the outer surface glabrous; leaf lamina serrate to almost entire **2. B. davidii**
4: Corolla yellow, orange or salmon-coloured; anthers inserted in the upper quarter of the corolla tube, barely included
6 Inflorescence spike-like; fruit a capsule; leaves crenate-serrate **4. B. australis**
6: Inflorescence thyrsoid; fruit a berry; leaves entire **5. B. madagascarensis**

Distribution

1. *Buddleja dysophylla (Benth.) Radlk.
Native to southern Africa. In Australia it apparently occurs as an uncommon weed of disturbed areas in Queensland. No herbarium material seen.

2. *Buddleja davidii Franch.
Indigenous to China and Japan, but cultivated and often naturalized throughout the world. Naturalized in Queensland, New South Wales (including the A.C.T.), and Victoria. Fourteen collections examined:- 8 collections by B.J. Lepschi from the A.C.T. (e.g. O'Conner Ridge, Lyneham, *B.J. Lepschi 877*; CANB) and neighbouring N.S.W. Other collections include:- N.S.W.: State Mine Hill road, 5 km NNE of Lithgow, *B.G. Briggs 7172* (NSW). Vic.: Monbulk Road, between Upper Ferntree Gully and Upwey, *D.A. Cooke 22000* (CANB); Mt Buffalo National Park, *A.C. Beauglehole 41684* (CANB).

3. *Buddleja lindleyana Fortune
Native to China, Macao, Hong Kong, and Japan. In Australia it occurs as an uncommon garden escape, which is doubtfully naturalized in Queensland. Only known from one collection (*D.A. Goy 1*), which lacks locality details.

4. Buddleja australis Vell.
Native of southern Brazil, Bolivia, Paraguay, and Argentina. In Australia it is an uncommon weed of disturbed areas in Queensland. Two collections examined:- Qld: Ashgrove, Brisbane, *C.T. White & S.L. Everist*, 6.viii.1934 (BRI); Simpson's Falls, Brisbane, *Swarbrick 8648* (BRI).

5. *Buddleja madagascarensis Lam.
Indigenous to Madagascar, but widely cultivated and naturalized in tropical and subtropical regions. It is naturalized in Queensland, and possibly also in New South Wales, South Australia, and Western Australia. Eight collections examined:- Qld: Noosa

National Park, *P.R. Sharpe 3830 et al.* (BRI); Boat Mountain, near Murgon, *B.K. Braithwaite*, 7.v.1986 (BRI). NSW: Whian Whian, *W.T. Jones 3521* (CANB); Taree, *W.F.M. Straatmas 74* (CANB). W.A.: Mounts Bay Drive, Perth, *G.J. Keighery 6241* (CANB); Golden Valley, 5 km E of North Dandalup, *G.J. Keighery 11010* (CANB).

6. *Buddleja globosa Hope

Native to Peru, Chile, and Argentina. In Australia it is an uncommon garden escape, once recorded from near the Grampians National Park, Victoria (*G. Cornwall G1142/89*).

Grass manuscript by C.C. Mez for Engler's "Pflanzenreich"

Bryan Simon
Queensland Herbarium

Introduction

In a recent issue of *Grass Literature* (**9**: 10 (1990)), compiled by Dr J.F. Veldkamp of the Rijksherbarium in Leiden, the attention of agrostologists was drawn to the existence at the Botanical Garden & Botanical Museum in Berlin of a manuscript of grasses by Dr Carl Christian Mez (1866-1944) for Adolf Engler's *Das Pflanzenreich*. This treatise is the only grass manuscript to have been prepared for *Das Pflanzenreich*. Copies of the manuscript were available in exchange for 250 carefully prepared, fully documented and identified herbarium specimens of extra-European origin, preferably grasses.

A copy of this treatise arrived at the Queensland Herbarium recently, and I have been analysing its contents. It consists of a partly type-written, partly hand-written manuscript of the tribe Paniceae of 2,277 pages, photocopied on A3 paper by staff of the Berlin herbarium. It has extensive information on the Berlin holdings of the Paniceae, on which it was mainly based, and which was almost completely destroyed during World War II. It is thus very helpful for interpreting the many names based on much material that has been lost. It contains a full revision of the tribe Paniceae, with synonymy, keys, latin descriptions, and lists of exsiccatae.

BRI is currently the only Australian herbarium to hold a copy of the Mez manuscript. Other copies are presently held in AAU, ARIZ, GENT, L, NYS, SI, and WAG according to *Grass Literature* **10**: 19 (1991), but further copies are still available from B.

The manuscript contains keys to and descriptions of 1800 species in 32 genera. Many of the species are new, but not effectively published because the manuscript constitutes photocopied handwritten material (Art. 29 of ICBN). Before these names are validated it would be wise to check on whether types still exist (in B or elsewhere), and if not to ascertain from the descriptions, keys and exsiccatae if they are synonyms of other taxa described since World War II. Furthermore, because of the narrow species concept used by Mez, the possibility exists that some of his "new" species may only be forms or ecotypes of established and accepted species.

Summary of contents of the manuscript

Genus	No. of species
Olyra	36
Burgeriochloa	1
Diandrolyra	1
Spinifex	6
Chaetium	3
Isachne	76
Oplismenus	13
Echinochloa	13
Setaria	138
Setariopsis	3
Panicum	696
Sacciolepis	24
Mesosetum	16
Thraysia	6
Ichnanthus	45
Paspalum	326
Amphicarpum	2
Eriochloa	23
Anthaenantia	4
Melinis	75
Arthropogon	2
Anthaenantiopsis	2
Neurachne	4
Homolepis	4
Urochloa	6
Digitaria	136
Reimaria	5

Stenotaphrum	8
Thuarea	2
Trachys	1
Cenchrus	23
Pennisetum	100

I have compiled a complete list on computer disk of the species names recognized by Mez in his treatment, from the keys and descriptions, and I am willing to supply anybody who is interested in having them on a formatted disk.

Camels: Their food preferences in central Australia

Les Pedley
Queensland Herbarium

Introduction

Though I have not delved deeply into the literature, there seems to be little information about the food preferences of dromedaries (*Camelus dromedarius*) in Australia. They were introduced as pack animals more than a century ago, and they have become naturalized in parts of central Australia. Though no longer used to transport goods, they are used to a limited extent in recreational pursuits. At least two firms in central Australia offer camel "safaris", up to two weeks in duration.

Last August I took part in one of these safaris: ten days on board a camel in and around Finke Gorge National Park. I therefore had the opportunity of observing the feeding behaviour of some 25 animals, one at extremely close quarters.

Camels occasionally graze grasses and forbs, but they are essentially browsers. Such large animals consume a lot of food, much of it of low quality; and they grab at plants every chance they get, moving or stationary, and ruminate at their leisure. It soon became apparent that these 25 camels had similar, definite food preferences. Steering a camel was difficult enough for a tyro, but it became almost impossible within 20 metres of a preferred species.

Acacia victoriae was plentiful and favoured (an "ice-cream species", as a colleague has termed it), but the undoubted favourite of all was *Capparis mitchellii* . Six or seven camels pigging out on a large one is something to see. Not only were particular plants selected, but particular parts of plants were sought after. Inflorescences of *Hakea suberea* were eaten readily, while the rest of the plant was rejected; and *Lysiana spathulata* on *Ficus platypoda* was selected, but the fig was not eaten.

A list of the plants eaten is reproduced below. The names follow the *Flora of Central Australia*.. The scale is:- 4: eaten avidly; 3: eaten with relish; 2: eaten without much enthusiasm; 1: eaten rather diffidently; 0: eaten occasionally.

Much of the time was spent ambling (with rather long strides) through shrubland or low woodland with mulga (*Acacia aneura s. lat.*) predominating, with occasional stands of *Acacia kempeana* and groves of *Acacia estrophiolata.* Mulga and *A. kempeana* were not eaten, though mistletoe (*Amyema* sp.) on mulga was. Definite identification of the mistletoe was not possible because the camels left nothing.

Camels eat a wide range of plants; they are sure-footed and can traverse steep and broken terrain such as the James Ranges; and they have a tremendous operational range away from water. They would therefore seem eminently adapted to exploit semi-arid areas of Australia. Yet nowhere do they occur in large numbers, and in most localities they are outnumbered by feral horses.

The ability of mobs of horses to move quickly and to build up numbers more quickly than do camels possibly gives them a competitive edge, despite their dependence on water. It is said that, because of the variety of their food and their ability to browse a long way from water, camels are less destructive to vegetation than are horses. It is true that horses appear to be quite destructive in Finke Gorge National Park where they are numerous. This would be a better place if they were removed.

Plants eaten by camels

Acacia estrophiolata	2
Acacia farnesiana (green)	2
Acacia tetragonophylla	1
Acacia victoriae	3
Amyema sp.	3
Atalaya hemiglauca	3
Callitris hugelii	1
Capparis mitchellii	4
Eucalyptus camaldulensis	0
Hakea leucoptera	1
Hakea suberea (flowers)	2
Heterodendrum oleifolium	1
Lysiana spathulata	3
Rhagodia spinescens	3
Santalum lanceolatum	3

A.S.B.S. Inc. BUSINESS

Fourteenth General Meeting

28th March 1992
Royal Botanic Gardens Sydney

As it was considered preferable not to hold the 14th General Meeting in conjunction with the "Systematic & Ecological Relationships of South Pacific Floras" conference (22–27 November 1991, Auckland, New Zealand), Council has agreed that the 14th General Meeting of the Australian Systematic Botany Society Incorporated will be held at the Royal Botanic Gardens Sydney (NSW) on saturday 28 March 1992.

Any member wishing to place an item (or items) on the agenda may still notify the Secretary (Dr Barry J. Conn) in writing. The closing date for agenda items is friday 13 March 1991.

Council Elections

In accordance with the Constitution of the Society, nominations are called for all positions on the Council for the 1991–1992 term of office:- President, Vice-President, Secretary, Treasurer, and two Councillors.

Each nominee must be proposed by two members, and his/her acceptance of nomination must accompany the nomination itself.

Judy West, the current President, having served two consecutive terms on Council as President, is ineligible to continue in that position.

Don Foreman, the current Treasurer, having served four consecutive terms on Council as Treasurer, is ineligible to continue in that position.

Nominations for the next term of office on Council must be sent on the Nomination Form or facsimile of same (included in *Newsletter* No. 67) to the Secretary (Dr Barry J. Conn). The closing date for Council nominations is friday 31 January 1992.

An Introduction to PATN

Weekend Workshop
28 & 29 March 1992

An introductory PATN workshop is being held for members of ASBS during the last weekend of March (28 & 29 March 1992) at the National Herbarium of New South Wales (NSW). Dr Daniel Faith (Division of Wildlife and Ecology, CSIRO) has kindly offered to lead the workshop.

The topics to be covered include:-

- Introduction and theoretical background
- Data input and manipulation/standardization
- Preliminary descriptive analyses
- Choosing a dissimilarity measure
- Ordination models
  - Phenetic approaches
  - Cladistic approaches
  - Identifying underlying gradients
- Clustering models
- Post-processing analyses
- Randomization tests
  - For ordination models
  - For clustering
  - For input to PAUP for PTP tests of cladistic structure

Anyone interested in participating in this workshop should contact Barry Conn (Workshop co-ordinator) by friday 28 February 1992. Since only a limited number of participants will be possible, those interested in attending are urged to indicate their intention as soon as possible.

Anyone requiring accommodation in Sydney can obtain information on available accommodation and costs from Barry.

Biogeography and Phylogenetics of Pacific Flora symposium

9–13 August 1992
A call for participants

The American Institute of Biological Sciences (AIBS) will hold its next annual meeting at the Sheraton Waikiki, in Honolulu (9-13 August 1992). The Botanical Society of America has invited ASBS to host a joint symposium during the AIBS annual meeting. Although the scheduling of the joint symposium is not finalized, it will probably be on the 11th or 12th of August.

It is hoped that there will be sufficient interest to have a full-day program; or if not, then the program will be restricted to a half-day symposium. The "Biogeography and Phylogenetics of Pacific Flora" symposium will combine with the "Patterns of Speciation in Hawaiian Flora and Fauna" symposium on the 10th of August and the "True and Virtual Islands: Do They Share a Common Paradigm?" symposium on the 13th of August. These symposia will form a 3-day minicourse in Pacific botany. Contributed papers to the general AIBS Meetings are a maximum of 15 minutes, however the length of symposium talks will be determined by the symposium organizer.

Financial support has been generously offered to ASBS by the National Tropical Botanical Garden of Hawaii. This is to be used to assist with the travel expenses of bringing six ASBS participants to Honolulu.

Anyone interested in contributing a paper to this joint symposium should contact Barry Conn (the symposium organizer), with the suggested title of the paper and an abstract by friday 28 February 1992, or preferably sooner. Further information and registration forms for the AIBS Meetings will be published in the March 1992 issue of *Bioscience*.

Barry Conn
Secretary, ASBS Inc.

Southern Temperate Ecosystems: Origin and Diversification

Australian Systematic Botany Society and
Southern Connection conference
January 18–22 1993, University of Tasmania

A new organization, called "Southern Connection", was formed at a meeting held in Honolulu last May as part of the Pacific Science Congress (see report in *Newsletter* **67**: 36). The proposed conference in January 1993 is a direct result of that meeting, and it is being jointly sponsored by ASBS. The First Notice for the conference is enclosed with this issue of the *Newsletter*.

I anticipate that there will be a strong contingent of overseas scientists attending, particularly from South America and New Zealand, as I have already had many replies to the overseas distribution of the first notice.

If you wish to receive further information regarding this conference, please fill in the enclosed form with your name, mailing address, fax number, and email address (if you have one), and send it to me as soon as possible.

Bob Hill
University of Tasmania

Systematic and Ecological Relationships of South Pacific Floras conference

The Opening Address

Eric Godley
President of the New Zealand Botanical Society

It is with great pleasure that I welcome the participants in the first-ever joint meeting of the Australian Systematic Botany Society and the New Zealand Botanical Society. It is also the first scientific meeting of the New Zealand Botanical Society since it was formed in November, 1988. We have 81 registrants:- 16 from Australia, one from Fiji, and 64 from New Zealand.

This is not, of course, the first time that Australian and New Zealand botanists have met formally on New Zealand soil. By a happy coincidence, the first meeting took place, as far as I can see, a century ago. It was in January 1891, down in Christchurch, and it was the third meeting of the Australasian Association for the Advancement of Science, as it was then called. I have looked through the report of that meeting, and as you might expect, the botanical programme in 1891 was much less diverse than that proposed for you at this meeting in 1991. But one item caught my eye, and I will tell you about it because it concerns something that Australia and New Zealand share. Here is a recommendation from Section E (Geography):-

"That inasmuch as the sea between New Zealand, on the one hand, and Australia and Tasmania on the other, has received no definite name, the Australasian Association for the Advancement of Science recommends that the name of Tasman Sea be given to it; and that a communication be sent to the Lords of the Admiralty requesting them to adopt this name by entering it upon the charts."

So you see that although we might not know

when the Tasman Sea was born, we know, at least, when it was christened.

At the Christchurch meeting, botany came under the Biology Section, whose President was the zoologist, Professor Haswell of Sydney. On the organizing committee were two New Zealand botanists. The elder was Thomas Kirk of Wellington, and the younger was Thomas Cheeseman, Secretary of the Auckland Institute and Museum, and in particular the Museum botanist.

We see here another happy connection between then and now. The Chairman of your organizing committee, Anthony Wright, has followed in Cheeseman's footsteps as botanist to the Auckland Museum, and he looks after Cheeseman's classic collections and others. Which brings me to the other members of the organizing committee. I would like to read their names out:-

Jessica Beever, DSIR Land Resources, Auckland;
Peter Buchanan, DSIR Plant Protection, Auckland;
Ewen Cameron, Department of Botany, University of Auckland;
Barry Conn, Royal Botanic Gardens, Sydney;
Phil Garnock-Jones, DSIR Land Resources, Christchurch;
Sandra Jones, Auckland Botanical Society; and
Colin Webb, DSIR Land Resources, Christchurch.

Without their hard work, we would not be here assembled; and already you have benefited from their planning, with excursions to the Waitakere Ranges and Rangitoto Island, as well as the Cladistic Workshop. I am sure that these further three days will be interesting and fruitful for you, both scientifically and socially. I hope that you will make new friends, renew old friendships, and have a happy and exciting time.

Abstracts

Cabbage tree: A threatened species?

R.E. Beever, J. Rees-George, G.I. Robertson, B.T. Hawthorne, and R.E. Beresford

DSIR Plant Protection,
Private Bag,
Auckland. New Zealand

The New Zealand cabbage tree, *Cordyline australis*, has traditionally been regarded as long-lived and virtually indestructible. For trees in the North Island, the situation has changed. Since mid-1987 reports of dead and dying cabbage trees become increasingly frequent (J. Rees-George, *et al.* (1990) Sudden decline of cabbage tree (*Cordyline australis*) in New Zealand. *N.Z. J. Bot.* **28**: 363-366). While initial reports of the disorder (termed Sudden Decline) were mainly from Northland and Auckland, reports from the Waikato, Bay of Plenty, Gisborne, and Hawkes Bay soon followed. Affected trees are now common around Turangi (Taupo), and Palmerston North (Manawatu). Occasional dying trees have been seen in Wellington city, and sporadically throughout the South Island.

The dynamics of the epidemic have been assessed by scoring samples of c. 50 trees at each of 34 locations from Whangarei (Northland, 35° 43' S) to Geraldine (Canterbury, 44° 06' S). Most of the trees selected were growing in modified sites visible from roads. The data set for the 16 northern survey sample sites (Whangarei to Taumarunui, 38° 53' S) indicates that the disorder has increased exponentially, with a mean proportion of dead trees by 1991 of 36% (s.e. 17%, range 6-60%). Extrapolation suggests that the epidemic in this region began in earnest in the mid 1980s, and that few of the surveyed trees will survive beyond 1995. Very few affected trees have been recorded at sample sites south of Taumarunui.

Cordyline australis is widespread and common throughout New Zealand — in swamps and scrub, along forest margins and roadsides, on farmland by streams and on sun-baked hillsides — and is widely cultivated as an ornamental. Limited observations indicate that death is most common in modified habitats (roadsides, farmland) and amongst cultivated plants, although significant numbers of sick and dying trees were observed in 1991 on Hen Island, a forested nature reserve off the north-east coast of northern New Zealand.

Is cabbage tree a threatened species? We suggest that it should be classified as "vulnerable" as a feature of the North Island landscape, because a rapid depletion of the population is occurring over much of its range. It is premature to conclude that it is "vulnerable" in the IUCN *Red Data Book* sense, because the wild population is still very large.

The distribution of some New Zealand hepatics and their Pacific relationships

J.E. Braggins[1] and E.A. Brown[2]

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[2] National Herb. NSW Royal Botanic Gardens, Mrs Macquaries Rd, Sydney, 2000. Australia

New Zealand has a rich hepatic flora, and as for most other taxa it shows a mixture of affinities. Particularly strong are the Gondwanan affinities shown best by the more stenotypic taxa, with species or species pairs found in New Zealand and South America, Tasmania and the Australian mainland in various combinations.

Links through to New Caledonia are also strong, but those to the rest of the Pacific and elsewhere are less well known at this stage. Gaps in our knowledge occur because of the regional nature of many taxonomic treatments and because the taxa involved often have not been intensively studied. Recent examples of extensions of ranges arising from new collections are frequent, and they often strengthen already recognized relationships. An example is the recent collection of *Riccardia furtiva* in Tasmania, which was previously regarded as an uncommon New Zealand endemic species. As with higher plants, endemism is generally high, and some taxa are known only from limited ranges or in some cases only from the type specimen.

Leaf anatomy in Gnaphalieae (Compositae)

Ilse Breitwieser

School of Biological Sciences,
Victoria University of Wellington,
Wellington. New Zealand

Leaf anatomical studies were carried out on the tribe Gnaphalieae (Compositae) with the aim of clarifying the status and relationships of the New Zealand taxa.

Leaf anatomy was described and compared for 48 taxa. The anatomical features regarded as particularly distinctive include:- lamina type and grade of differentiation, position of stomata, relative thickness of epidermis and cuticle, shape of palisade cells, number of bundle-sheath layers and presence of sclerenchyma caps, water storage cells, secretory canals, abaxial collenchyma, and a protruding midrib.

The data were also analysed numerically. It will be shown that leaf anatomy data do provide taxonomically useful characters for the classification of the Gnaphalieae.

Plant resource data standards — Validation and use in SIS

Arthur D. Chapman

Environmental Resources Information Network,
Australian National Parks & Wildlife Service,
GPO Box 636,
Canberra, 2601. Australia

Important environmental decisions are being made in many areas of the world with ever increasing urgency. In most cases those decisions are being made with insufficient knowledge of the systems involved, and are based on inadequate data. Databases of plant and animal data have existed for centuries, but it is only now, with the increased use of computers, and their use in spatial information systems (SIS) and environmental decision support systems, that the significance of much of these data is being realized.

Many of the data collected in biological and ecological surveys, and as a result of taxonomic studies, are proving to be incompatible when combined in these systems. Historical data, collected with other uses in mind, are often inaccurately geocoded and require extensive validation before being usable. Survey data are seldom vouchered, and are often collected using varying polygon sizes and shapes and different recording methods. It is important that standards for the recording and transfer of data be developed now and implemented as soon as possible. Methods of validating both existing and new data need to be developed and used at early stages in the databasing process.

The ERIN Unit in Canberra is taking a leading role in the development of Standards for recording biological data, and in developing methods of validating point records. The use of both survey and herbarium data in spatial information systems is demonstrated, and the importance of using a site-based approach wherever possible is emphasized.

A comparative study of Metrosideros–dominated primary succession on recent a'a lava flows at Rangitoto Island, New Zealand, and Mauna Loa, Hawai'i

B.D. Clarkson[1] and J.O. Juvik[2]

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Univ. Hawai'i at Hilo,
Hawai'i. USA

Closely related species of the genus *Metrosideros* (Myrtaceae) comprise the dominant colonizing trees on recent basaltic lava flows at Rangitoto Island, New Zealand, and Mauna Loa, Hawai'i. *Metrosideros* forest development on recent a'a substrates at these locations are compared with respect

to floristic relationships, colonization and establishment patterns, and the growth and population structure of *Metrosideros*.

The floristic similarity between colonizing species in Hawai'i and New Zealand is greatest during early succession, where severe environmental and substrate conditions restrict the potential pool of colonizing species.

Species colonization, establishment and population structure during early succession reflect the interplay of both stochastic and deterministic factors. Growth habit differences (e.g. canopy shape) between Hawai'ian and New Zealand *Metrosideros* produce divergent patterns of microclimate and substrate modification, and result in quite distinctive successional pathways.

Climatic and edaphic correlates of divaricating species in central North Island

B.D. Clarkson[1], J.R. Leathwick[2] and M.S. McGlone[3]

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Data collected from 128 central North Island sites ranging from Mt Taranaki in the west to Gisborne in the east were used to determine the climatic and edaphic correlates of the distribution of divaricating species.

Numbers of species are greatest on alluvial flats or colluvial toeslopes with significant climatic stress (e.g. wide temperature extremes) and/or strongly fluctuating water tables. Fertile alluvial flats with well-drained soils or more favourable climates (e.g. adequate year round rainfall) tend to have more divaricating species than other topographic types (e.g. hillslopes), but fewer than the first-mentioned alluvial flats.

Numbers of divaricating species are low in mild moderately-wet to wet climates, and are lowest on mild climate offshore islands.

Discussion of the results will focus on climatic stress, soil fertility, and competitive interactions between broad-leaved and divaricating species.

Relationships within the Lamiales

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A cladistic study of the Lamiales suggests that a re-evaluation of the infra-ordinal relationships is necessary. The genera *Oncinocalyx* and *Teucridium*, both currently circumscribed in the Verbenaceae, are probably better placed in the Labiatae. The genus *Spartothamnella*, currently circumscribed in the subfamily Chloanthoideae (Verbenaceae) should probably be placed in the subfamily Viticoideae (Verbenaceae). This study suggests that the subfamily Chloanthoideae should be included in the Labiatae rather than in the Verbenaceae, and not maintained as a separate family (the Chloanthaceae).

Within the Labiatae, the tribe Prostanthereae is monophyletic, and its sister group is the non-prostantheroid Labiatae (excluding *Teucrium*). It is suggested that *Teucrium* should not be included in the tribe Ajugeae (Labiatae). The relationships between the non-Prostanthereae tribes of the Labiatae have not been completely resolved.

The constraints of freedom — Callistemon and Melaleuca in Australia and New Caledonia

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The genera *Callistemon* R.Br. and *Melaleuca* L (Myrtaceae) conventionally are distinguished on features of the androecium, the staminal filaments being free in the former while in the latter they are fused at the base and grouped into five fascicles. Strict adherence to this circumscription will result in several pairs of apparent sister species being separated, with one of the species classified in *Callistemon* and the other in *Melaleuca*. Other characters are being studied in collaboration with P.F. Lumley and R.D. Spencer (MEL) and J.W. Dawson (WELTU) prior to a re-evaluation of generic limits.

The New Caledonian endemic species of the complex apparently fall into two groups, one of which may be allied to eastern Australian species. The closer relationships of the other group are unclear. However, separate identity at generic level

for the New Caledonian taxa seems unlikely.

Cladistic genealogies: An illustrated history of phylogenetic systematics 1864-1950

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Recent reference texts on biological systematics trace the origin of cladistics/phylogenetic systematics as a comprehensive theory and precise method to the 1950 publication of Willi Hennig's *Grundzüge einer Theorie der phylogenetischen Systematik.* In contrast to this widely accepted myth, the basic axioms and methods of cladistics can be found explicitly stated and utilized by many systematists from 1864 onwards. Citation study indicates that much of this work was either known to Hennig or to an author cited by him. Cladistic methodologies developed by the palaeobotanist Walter Zimmermann, the ethologist Konrad Lorenz, and the Australasian entomologist Robin J. Tillyard were particularly influential sources.

Reference:-

Craw, R.C. (in press) Margins of cladistics: identity, difference and place in the emergence of phylogenetic systematics, 1864-1975. In: *Trees of Life: Philosophical Problems in Evolutionary Biology* (ed. P. Griffiths). Kluwer, The Netherlands.

Distribution patterns in Metrosideros

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According to one interpretation, *Metrosideros* can be divided into 2 subgenera — *Metrosideros* and *Mearnsia. Metrosideros* is taxonomically uniform, and is represented on the continental fringe islands of New Zealand, Lord Howe, New Caledonia and the Solomons, as well as on a number of high volcanic islands ranging to the central Pacific. *Mearnsia* is more diverse, and is restricted to continental islands and continents — New Zealand, New Caledonia, Solomons, New Guinea, Philippines, as well as one species each in South Africa and southern South America.

Metrosideros comprises shrubs and trees, some of which are hemi-epiphytes, while *Mearnsia* comprises small trees, some of which are epiphytic, and root climbing lianes.

Both subgenera have small, almost thread-like seeds, which may be transported by gales and tropical hurricanes. Some species of subgenus *Metrosideros* are prominent as pioneers on lava flows, while those of subgenus *Mearnsia* are mostly found in moist mature forests.

Fruit anatomy and systematics of the Simaroubaceae

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The Simaroubaceae *s. lat.* is a pantropical to warm-temperate family of trees and shrubs. Its delimitation has often been sought with great difficulty, because of the considerable variation within the family. Relationships among the approximately 30 genera remain poorly understood, and at least seven segregate families have been proposed.

In this study, fruit anatomy was surveyed in 28 genera in an effort to broaden the data base in the family, so that inter-generic and tribal affinities may be better assessed.

There is some variation in the exocarp, especially in the thickness. Lignification of the outer epidermis is limited to three genera. There is also marked variation in the mesocarp, particularly in the lignification of the inner layers, occurrence of crystals, presence of resin canals, distribution of sclereids, and the position of the vascular bundles.

Nine endocarp types are recognized, the distribution of which correlates well with differences in floral morphology, and gives some support to Engler's subfamilies. The Irvingioideae, Kirkioideae, Picramnioideae and Alvaradoideae each display unique endocarp types that are different from that which characterizes all genera of the Simarouboideae. The Surianoideae are diverse:- *Suriana* and *Cadellia* share one endocarp type, while *Recchia* and *Guilfoylia* each have very different types.

The impact of these data on the taxonomy of the family is discussed.

An introduction to cladistics, with

examples from Hebe (Scrophulariaceae)

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Cladistics, or phylogenetic systematics, is a way of using character information in systematics, and does not necessarily use computers. Its aims are:- 1) to produce branching diagrams (cladograms) that represent the historical pattern of character evolution in a group; and 2) to reflect this pattern in classifications. Many good classifications are inherently, if not explicitly, cladistic.

For cladogram production, only apomorphic (derived) states of characters are useful, because plesiomorphic (ancestral) states do not indicate shared ancestry. Character states are polarized as apomorphic or plesiomorphic by reference to the states represented in the outgroup, usually the sister group, which shares a common ancestor with the ingroup or study group. Species with synapomorphies (shared apomorphies) are placed together on branches of the cladogram in such a way that the fewest number of unique evolutionary events is assumed.

Cladists accept only monophyletic groups in classifications, rejecting paraphyletic and polyphyletic groups. Monophyletic groups contain all the descendants of an ancestor and exclude taxa not descended from that ancestor. Thus the nearest relative of each member of a monophyletic group is also a member of the group. Monophyletic groups can be reliably discovered only by cladistic analysis.

Paraphyletic groups include some, but not all, descendants of an ancestor. They occur when groups are characterized by shared plesiomorphic character states (symplesiomorphies) only. Thus the nearest relatives of some members of a paraphyletic group are to be found in other groups. Paraphyletic groups are a consequence of using both states of a character to define groups. Such phenetic analyses produce both monophyletic and paraphyletic groups, but cannot provide a means to distinguish between them.

Polyphyletic groups result when descendants of two or more separate ancestors are grouped together. Thus some members of the group are not related. They occur as a result of misinterpreting parallelisms or convergences as synapomorphies, and can occur as mistakes in both cladistic and phenetic analyses.

The application of strictly dichotomous hierarchical classifications, so that phylogeny can be precisely inferred from the classification, is not widely practiced. In most cases, cladists accept only monophyletic groups, and use sequencing conventions to imply phylogenetic information among equally ranked taxa.

Hebe and its relatives *Parahebe* and *Chionohebe* form a monophyletic assemblage, with most of the species in New Zealand. Generic boundaries in the group have always been unclear. New characters, and those that have been traditionally used to classify the group, have been used in deriving a cladogram, from which the monophyly of the genera may be examined. Traditional use of both plesiomorphic and apomorphic character states has resulted in taxa that are paraphyletic, and misinterpretations of parallelisms have led to taxa that are polyphyletic. A generic classification that accepts only monophyletic groups would probably need to recognize more genera, but *Hebe* itself would be largely unaffected.

Revisiting rarity — A botanical perspective on rarity and extinction

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Recent developments in conservation biology have focused on the processes that threaten the viability of small populations. In particular, the concepts of minimum viable population (MVP) and population vulnerability analysis (PVA) have received considerable attention, and have recently been used as a basis for assessing extinction threats in a re-evaluation of IUCN threatened species categories. However, these ideas have been largely developed for vertebrate animals, and their application to plants (and other biota) has not been critically examined.

In this paper we review, with reference to threatened plants, what is meant by the concept of

rarity and the reasons why it occurs. We then consider the factors that threaten small plant populations making them vulnerable to extinction, and critically evaluate the usefulness of the MVP and PVA concepts for threatened plant conservation.

Geographic relationships of the Rhytismataceae of New Zealand

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Biogeographic relationships between the species of Rhytismataceae (discomycete fungi) occurring in New Zealand and those found in other land masses are compared. Few species are widespread in both the northern and southern hemispheres. The only New Zealand species known from the northern hemisphere are *Hypoderma rubi* and *Laphodermium gramineum*. Sixteen other New Zealand species, or their vicariant partners, are known from elsewhere in the southern hemisphere. These 16 species have two distinct patterns of distribution within the southern hemisphere. Each pattern correlates with a distinct pattern of distribution within New Zealand. Fungi may be potentially as valuable for biogeographic studies as are other organisms. At present their usefulness is limited by uncertainty about phylogenetic relationships, and by lack of distribution data from many areas.

Extinction and diversity in Tasmania in the Pleistocene

Gregory J. Jordan

The current rainforest flora of Tasmania is very species poor, but reasonably diverse sclerophyll and alpine floras are present. Many rainforest taxa with affinities to extant species with Pacific distributions existed in Tasmania in the early and mid Tertiary. They became extinct during the Tertiary and early Pleistocene, apparently due to progressively cooler, drier and less equable climates and to increasing fluctuations in climate on a 10000-year scale. Microfossil evidence shows that several of these taxa, including *Nothofagus* subgenus *Brassospora*, *Quintinia*, *Dacrycarpus* and *Dacrydium*, persisted into the Early Pleistocene in Tasmania.

New macrofossil evidence shows that other taxa with affinities to extant species of the wet forests of more northerly parts of Australia also persisted into the Pleistocene, e.g. species of *Acacia*, *Rubus* and Myrtaceae subfamily Myrtoideae. Fossil evidence gives minimum values to extinctions in any period. Comparisons of diversity of leaves found in fossil and recent sediments suggest that wet forest diversity declined from the mid Tertiary to the mid Pleistocene.

The presence of extinct species of sclerophyllous taxa in Pleistocene sediments, together with the huge habitat ranges of some extant sclerophyllous species, suggest that there has been significant extinction of sclerophyll taxa during the Quaternary, although it is likely that speciation of some groups has occurred to take up some of the "ecological slack" caused by extinctions. There is no evidence of such speciation in Tasmanian rainforest taxa.

Stigmatic exudate rewards and self-incompatibility in a primitive angiosperm, Pseudowintera colorata (Winteraceae)

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Stigmatic exudate-eating chironomid flies (*Smittia*) and pollen-eating halodid beetles are the most common visitors to flowers of *Pseudowintera colorata*. Plants are self-incompatible, but after selfing pollen tubes penetrate the nucellus. Self-pollination followed by cross-pollination results in considerable seed set; the incompatibility reaction therefore occurs before fertilization. When pollen is applied to stigmas, the exudate dries rapidly and does not usually reappear.

A review of anthophytes (angiosperms, gnetophytes, cycadeoids and Pentoxylales) suggests that their common ancestor was co-sexual and pollinated by insects (possibly including flies) for whom nectar was an important reward. The angiosperm stigma may have evolved from a pollination drop mechanism via an adaxial stigmatic surface and a subsequent shift of the receptive area to the external surface of the carpel as it closed. This hypothesis helps to explain the anatropous, bitegmic ovules of primitive angiosperms. The unspecialized pollination mechanisms of New Zealand plants may be the closest approach to the pre-angiosperm pollination world that remains today.

Genetic and environmental components of local variation in tussock-forming Festuca

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Festuca novae-zelandiae (Hack.) Cockayne, is a long-lived out-crossing caespitose grass endemic to New Zealand. In pre-human New Zealand, *F. novae-zelandiae* would have been restricted to disturbed or stressed sites, such as young river terraces and frost flats. However, Polynesian and European deforestation, coupled with burning and grazing, has enabled *F. novae-zelandiae* to markedly expand its range, such that it is now common, particularly in eastern montane South Island.

This study aimed to investigate the patterns of variation among populations of *F. novae-zelandiae* in different environments, as well as the degree of differentiation that has occurred both within *F. novae-zelandiae* and between it and *F. matthewsii*, a closely related species in higher rainfall areas. Genetic variation was estimated using isozyme electrophoresis, and this was related to both morphological variation and the vegetation in which the plants occurred.

Ghost stories: Adaptation of the New Zealand flora to vertebrate browsing

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Did New Zealand plants have specific adaptations which countered browsing by the extinct moa? Among suggested adaptations to browsing are:- spines; mimicry; camouflage through colouring and leaf shape modification; the divaricating plant form; and certain tree juveniles that are either divaricating or have tough, low-nutrient leaves.

Some tree and shrub juveniles have irregularly-lobed, dark or blotched leaves. These features may serve to camouflage young, vulnerable growth from browsers. We do not accept spinescence as being a browsing adaptation in New Zealand. The alleged cases of palatable plants mimicking unpalatable plants and objects are better explained by environmental factors, convergence or chance. Some divaricating plants and tree juveniles have a marked resistance to mammalian browsing. Nevertheless, moa browsing was probably not a significant factor in the development of the small-leaved divaricating form and tough-leaved juvenile foliage. Densely-branched, small-leaved shrubs and small trees are characteristic of many semi-arid or winter-wet areas in the world. Heterophyllous juveniles are also widespread. These growth forms are by no means confined to New Zealand, and therefore are unlikely to be a unique response to moa browsing.

Atkinson and Greenwood in 1989 suggested several tests that could be used to distinguish adaptation to browsing from adaptation to environmental stress. The "geographic distribution test" for plants with putative anti-browsing adaptations is inconclusive. The "site preference test", in which it is assumed that plants resistant to browsing will prefer sites once heavily used by moas and be uncommon on sites not at risk from browsing, is difficult to apply rigorously, but it seems to support the strong influence of climatic/edaphic factors. The "life cycle test", in which it is assumed that browsing adaptations should be best expressed in low-growing and juvenile plants and be lost with increased height, is not supported by our observations.

Our conclusion is that few of the suggested anti-browsing adaptations stand up to critical scrutiny. In particular, adaptation to edaphic and climatic stress is the sole reason for the development of divaricating and heteroblastic trees in New Zealand.

Corynocarpus: An isolated genus of Australasian trees

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The genus *Corynocarpus* is based on material collected in New Zealand in 1773 during Captain Cook's second voyage. Three years later the genus was formally erected by Johann Reinhold and Georg Forster, and the New Zealand species, *C. laevigatus*, was described. Over the next 200 years four further species were recognized:- *C. cribbianus* 1897 (Australia, New Guinea), *C. similis* 1903 (Vanuatu, Solomon Islands, New Guinea), *C. dissimilis* 1903 (New Caledonia), and *C. rupestris* 1984 (Australia). In 1897 Engler gave the genus distinct family status.

Probably few genera have aroused as much debate or interest as *Corynocarpus*. On a global scale, the relationships proposed for this apparent misfit are many and varied. On a local scale, the origin of the New Zealand species, known as karaka or kopi, has been argued strongly by both Polynesians and Europeans.

All five species have several features in common, including an unusual combination of floral characters and the absence of growth rings. Equally, all five possess a number of different characters in keeping with their native environments.

This paper gives a thumbnail sketch of the genus and its members, with particular emphasis on taxonomy, ecology, ethnobotany, and evolution.

Setting priorities for the conservation of New Zealand's plants and animals

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The Department of Conservation is responsible for ensuring the survival of New Zealand's plants and animals, and the communities and ecosystems of which they are a part. The Department's effectiveness in achieving this is dependent to a large degree on its ability to prioritize its work so as to maximize conservation gains.

While a process has been established for identifying nationally important communities and ecosystems through the Protected Natural Areas Programme, a similar process has not been developed to date to assist in setting priorities for the conservation of New Zealand's threatened species. The absence of such a system has led to higher-order taxa frequently receiving more conservation effort than do lower-order taxa.

The Department, with assistance from the Department of Scientific and Industrial Research, as well as the Forest and Bird Protection Society, has developed a set of criteria that assess the relative priority of each threatened species for conservation action. The criteria used are applicable to any animal or plant that occurs in New Zealand.

Response of Iris lacustris, a threatened North American species, to drought

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The reproductive ecology of *Iris lacustris* was investigated in permanent quadrats along a gradient of canopy conditions, from 1987 through to 1990. A record drought in 1988 had a significant impact on the production of vegetative ramets ($P<0.05$), floral ramets ($P<0.01$) and mature fruits ($P<0.05$). In addition, responses to the drought varied with canopy conditions. During the drought 46% and 68% of the vegetative ramets died on the open and the densely-shaded sites, respectively. Through to 1990 there was no recovery in the density of vegetative ramets on either site type. In contrast, the drought had little impact on the density of vegetative ramets on partially-shaded sites.

Although the drought had little effect on sexual reproduction in 1988, flower production in 1989 declined significantly ($P<0.01$) on both the open and partially-shaded sites. Within only one year, however, flower production recovered significantly ($P<0.01$) to 38% and 82% of pre-drought levels on open and partially-shaded sites, respectively. Fruit production over the 1988 to 1990 period followed the respective pattern of flower production at each site type. Sexual reproduction did not occur on densely-shaded sites, even during periods of favourable soil moisture.

These differences in response to drought pose important implications for the management of this threatened species.

Marine algae of the Chatham Islands

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The geological history of the Chatham Islands, their distance from the New Zealand mainland, as well as their position straddling the Subtropical Convergence, provides a situation of considerable interest. The Chatham Islands are the type locality for a number of species of New Zealand marine macroalgae collected last century. A compilation of the flora was published by Lemmerman in 1906. It has taken a further 85 years for another account of

the algae from these islands to be published (Nelson, Adams & Hay, 1991).

The algal flora of the Chathams contains both northern and southern elements as well as endemic species and genera. The absence of a number of species that are common on the mainland in similar habitats at equivalent latitudes is noteworthy. It is clear, however, that the relationships of this flora to that of offshore islands and mainland New Zealand, as well as to other island groups in the South Pacific, will only be fully understood when taxonomic and revisional studies are completed.

Grammitidaceae of the South Pacific

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About 87 species of Grammitidaceae (c. 15% of the family), belonging to 18 species groups, occur in the South Pacific. Their distribution is as follows:- Australia: 22 (13 endemic); New Zealand: 10 (3 endemic); Solomon Is: 17 (2 endemic); Vanuatu: 16 (4 endemic); New Caledonia: 11 (5 endemic); Fiji: 18 (6 endemic); Samoa: 17 (7 endemic); Tonga: 1 (0 endemic); Cook Is: 2 (1 endemic); Society Is.: 12 (8 endemic); Tubai (Austral) Is.: 2 (2 endemic); Marquesas Is: 3 (1 endemic). Fifty-two species (60%) are endemic to a single island or an island group, 14 (16%) occur in two island groups, 3 (3%) are on three island groups, 1 (1%) is on four island groups and 17 (20%) extend westwards to Malesia.

Three distinct phytogeographical elements can be distinguished. The South Temperate element comprises a single species group (12 species), which includes the 7 Australian species occurring in New South Wales, Victoria and Tasmania and 1 on Lord Howe Is., the 10 New Zealand species and the 3 temperate South American species, all of which also occur in New Zealand.

The Malesian element is the largest, consisting of 15 species groups (71 species), and ranging from tropical Australia and Melanesia to Tubai Is. and Marquesas Is, with its greatest diversity in the West Pacific. Four species occur throughout Malesia and the Pacific while 11 species occur throughout Malesia, but only reach the West Pacific, and 2 species are found only in Papua New Guinea and the West Pacific.

The African/American element is the smallest, and contains 2 species groups. Three species of *Grammitis* subgenus *Grammitis*, a group known from tropical Africa and tropical America but absent from Malesia, occur in Vanuatu, Fiji, Samoa and Tahiti. One species of *Lellingeria*, a genus occurring in tropical Africa, tropical America and the Hawaii Is but absent from Malesia, is known from Tahiti.

Cladistic analysis of the tribe Epacrideae (Epacridaceae)

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Recent cladistic work on the family Epacridaceae (southern heaths) has focused on the higher-level relationships of this family:- firstly, whether or not the family is monophyletic; and secondly, whether the tribal relationships suggested by earlier workers could be confirmed by using cladistic analyses.

The analyses indicate that the Epacridaceae is monophyletic if it includes *Lebetanthus* and *Prionotes*, which were considered as a distinct family by Hutchinson and others, and that the family is probably derived from the Rhododendroideae subfamily of the Ericaceae, rather than the Ericoideae, as suggested by Smith-White. Within the family two main clades and four sub-clades are present; taxonomically these are best considered as subfamily and tribal groupings, respectively. The composition of these groups differs somewhat from those of earlier workers such as Drude and Watson.

Once these higher level relationships were established, analysis of the monophyletic sub-groups began. Study of the tribe Styphelieae has been completed, and has resulted in some re-assessment of generic limits. The results of the preliminary work on the tribe Epacrideae will be presented in this talk, with emphasis on the characters used and the problems involved in attempting to establish homologies.

Systematics of the Pacific Gardenieae (Rubiaceae)

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The Gardenieae is a tribe of tropical and subtropical shrubs and small trees, centred on two large, poorly-differentiated but nonetheless heterogeneous genera:- *Randia* and *Gardenia*. Due to the proliferation of new genera from the ensuing dismemberment of these two taxa, the Gardenieae now has the largest number of genera of any tribe in the Rubiaceae. Without exception, the revisions have taken place on a regional basis, initially in Africa and more recently in Asia, and have resulted in a plethora of small or monotypic genera. The Australian and Pacific taxa have remained essentially uninvestigated.

Cladistic analyses based on 110 binary and multistate characters of 37 species of the Australian Gardenieae demonstrate that six robust taxonomic groups can be recognized at the generic level. The six Australian genera are assigned to *Aidia* (2 spp.), *Atractocarpus* (7 spp.), *Gardenia* (19 spp.), *Kailarsenia* (3 spp.), *Rothmannia* (1 sp.), and a new genus (5 spp.).

The relationships of these genera to the Pacific and Asian species currently included in *Randia s. lat.* and its segregate genera (*Aidia, Atractocarpus, Kailarsenia, Kochummenia, Neofranciella, Pelagodendron, Porterandia, Rothmannia, Sukunia, Sulitia* and *Trukia*) have been investigated. Although a sizeable number of undescribed and poorly-known taxa in New Caledonia, Vanuatu, the Solomon Islands and beyond require further investigation, it is apparent that some of these genera do not warrant recognition:- *Pelagodendron*(= *Aidia*), *Neofranciella, Sukunia, Sulitia* and *Trukia*(= *Atractocarpus*); and two others remain in doubt:- *Kochummenia* and *Porterandia* (= ?*Atractocarpus*).

Brachyglottis compacta: Ecology and conservation of a specialized, restricted endemic, shrubby daisy

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Brachyglottis compacta is a shrubby member of the Asteraceae, and is one of a number of New Zealand species with extremely restricted distribution, in this case to the limestone cliffs at Castlepoint, on the eastern Wairarapa coast. Conservation techniques need to be evaluated with an understanding of its ecology.

Investigations are continuing into the demography and ecology of the Castlepoint tree daisy. Studies show that its habitat is restricted to steep, exposed areas, where soil development is poor. Populations vary in structure, and some show indications of past disturbances resulting in failure of recruitment. Growth rates are low. Flowering is prolific and continues throughout the year, while peaking in summer. Small plants do not flower at all. Seed production is reduced by inflorescence predation, and seedling establishment is infrequent, tending to occur in disturbed areas.

A popular holiday spot, most visitors to Castlepoint and Castle Rock are unaware of the presence of a rare plant. Though vigorous, its restricted distribution places the species at risk. One way to lessen this risk is to take the species into horticulture, although it is not easy to grow. A hybrid form is readily available under the name of *Senecio* "Sunshine", but nomenclatural confusion can be a disadvantage, and genetic dilution will occur.

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Pleurotus in the South Pacific

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Although 15 species of *Pleurotus* have been recorded for New Zealand, mainly from material collected by Colenso last century, much of this material is either missing or in poor condition, or has been transferred to other genera. Recent studies indicate that there are almost certainly six species of *Pleurotus s. str.* in New Zealand:- *P. australis, P. parsonsii, P. rattenburyi, P. opuntiae, P.* aff. *dryinus*, and possibly *P. pulmonarius*, some of which are conspicuous components of the mushroom flora. Some are also recorded from South Pacific islands. Although the Pacific coastal regions of Australia and South America have records of pleurotoid fungi, few or none of these appear to be true species of *Pleurotus*. The identity and distribution of some of these other pleurotoid fungi will be discussed.

Threatened plant recovery planning —

A New Zealand case study

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Although formal species recovery plans have no basis in New Zealand legal statutes, they provide a mechanism for carrying out co-ordinated recovery planning for threatened plant taxa. Draft plans are sent to the New Zealand Conservation Authority and the relevant Conservation Board for checking and approval, before final approval by the Minister of Conservation. No recovery plans have yet been approved for New Zealand plants. One is being written in an *ad hoc* fashion, with co-ordination provided by the Threatened Species Unit for the Department of Conservation, and recovery plans have been recommended for several species on the Chatham Islands.

A draft plan has been written for *Clianthus puniceus* (common names: kowhai ngutukaka or kaka beak). This is a well-known plant, being widely cultivated for its showy red, pink or white flowers, and it is commonly used as an image of New Zealand character on tourist souvenirs and other memorabilia. It formerly occurred over a large area of eastern lowland North Island and on offshore islands. Around 200 individuals remain in the wild, and these populations are classified as endangered (i.e. in danger of extinction if the causal factors continue operating). Extensive habitat destruction and the depredations of introduced animals are the main causes of decline. Active management is required to stop the otherwise apparently inevitable decline to extinction of the wild populations. Active management must be prefaced by good planning, and a sound understanding of autecology and ecosystem processes.

The draft recovery plan contains sections on the current state of taxonomy, and information on distribution, ecology, biology, genetics, threats, research and management goals. A workplan and research and management recommendations are included.

The adventive flora of the Cook Islands

W.R. Sykes

Botany Institute,
DSIR Land Resources,
Private Bag,
Christchurch. New Zealand

The indigenous flora of the tropical Pacific is threatened by the invasion of alien plants, and as the 20th century draws to a close the danger seems to be increasing for many islands. The number of adventives now often exceeds that of the indigenous species. This paper discusses the impact that adventive plants have made in the Cook Islands.

The composition of the indigenous flora is now well-catalogued, although little has been published except for the islands of Rarotonga and Aitutaki. Much less has been written on the adventive flora, although large areas of the larger islands are now dominated by such plants. Most of the adventive plants entered the area via the main island of Rarotonga, and many have got no further. The outer islands have varying numbers of adventives, reflecting the amount of agricultural and horticultural developments that have occurred there. Certain species present on the outer islands seem to have almost disappeared from Rarotonga, probably because of later invasions there of more aggressive species. Most disturbing is the apparently fairly recent spread of aggressive adventives into more or less undisturbed indigenous vegetation. Most of these weeds are escapes from cultivation.

Generic limits in New Zealand Gnaphalieae

J.M. Ward

Department of Plant and Microbial Sciences,
University of Canterbury,
Christchurch. New Zealand

Problems with the classification of the New Zealand species of Gnaphalieae will be discussed. Early classification of Australasian Gnaphalieae relied heavily on technical characters used to distinguish Northern Hemisphere genera; not surprisingly, the outcome has not proved to be satisfactory.

Attempts to achieve an understanding of the relationships among the New Zealand taxa are hampered by overlapping groups of correlated characters, and by ignorance of the evolutionary history of the group, which makes useful cladistic analysis difficult.

Current research includes assembling a large data base from direct investigation of the species, calculation of a measure of phenetic similarity between all pairs of species, and attempts to define

monophyletic groups through evidence of hybridization. Cladistic analysis is planned once monophyly is established and enough characters can be polarized.

Results obtained so far will be compared with recently published work on the classification of Gnaphalieae.

Evolution of endemics within Fiji: Allopatric or sympatric speciation?

Anni Watkins

School of Pure and Applied Sciences,
University of the South Pacific,
PO Box 1168,
Suva. Fiji

Diversity on island groups must be considered to be a balance between invasion, speciation, and extinction. The classic evolutionary story for archipelagoes is that of relatively-recent rapid allopatric speciation due to fragmentation of invading populations across a series of islands of lesser or greater physical isolation. The Fiji islands are, however, continental in origin, which prompts investigation into whether the evolutionary patterns differ from the classic model.

This paper marks the beginning of a much bigger project to collate biogeographic and evolutionary information on the distribution of the Fijian flora within the island group. Data will be presented on the distribution of certain endemic species groups, showing the degree of present-day isolation by geographic location, altitudinal range, and ecology. At present, insufficient data exist on temporal isolation. Thus, it is hoped to give a broad view of which isolating mechanisms have featured most in the evolution of the endemic flora of Fiji.

Taxic diversity — Useful or toxic?

Judy G. West

Australian National Herbarium,
Division of Plant Industry, CSIRO,
PO Box 1600,
Canberra, 2601. Australia

Biologists and managers around the world are under great pressure to protect our biological diversity with limited resources. In these circumstances, it is critical that we have effective means of measuring biodiversity, and especially to be able to compare local biodiversity. Instead of relying on indices of species richness and relative abundance, or differentiation along habitat gradients, we need to consider a system of priorities that reflect taxonomic diversity.

It has been proposed by Vane-Wright *et al.* that in order to set priorities about species and area conservation we need to develop measures of species differences, which can be made in terms of genealogical relationships between species. These relationships are best inferred from classifications constructed through cladistic methodologies. In this paper, different measures of taxonomic diversity are compared, so that areas for the conservation of biodiversity can be prioritized.

While it is important to put more resources into phylogenetic analyses and to further understand the evolution and relationships of our biota, a balance is needed. We should be careful that the use of measures of taxonomic diversity does not highjack vital resources needed for conservation of critical areas. We need to determine whether cladistics is really necessary in this conservation process.

Logic, n. The art of thinking and reasoning in strict accordance with the limitations and incapacities of the human misunderstanding. The basis of logic is the syllogism, consisting of a major and a minor premise and a conclusion — thus:-

Major premise: sixty men can do a piece of work sixty times as quickly as one man.

Minor premise: one man can dig a post-hole in sixty seconds.

Conclusion: sixty men can dig a post-hole in one second.

This may be called the syllogism arithmetical, in which, by combining logic and mathematics, we obtain a double certainty and are twice blessed.

Newtonian, adj. Pertaining to a philosophy of the universe, invented by Newton, who discovered that an apple will fall to the ground, but was unable to say why. His successors and disciples have advanced so far as to be able to say when.

Gravitation, n. The tendency of all bodies to approach one another with strength proportional to the quantity of matter they contain — the quantity of matter they contain being ascertained by the strength of their tendency to approach one another. This is a lovely and edifying illustration of how science, having made A the proof of B, makes B the proof of A.

Ambrose Bierce, *The Devil's Dictionary*

REPORTS

Australian Biological Resources Study

Helen Hewson has been appointed Associate Director, Flora of Australia. Helen's previous job as Scientific Editor, currently occupied on an acting basis by Helen Thompson, will be advertised shortly for permanent filling. Jane Mowatt recently joined us as acting Assistant Scientific Editor, pending a new appointment to Helen Hewson's old position. Our Administrative Services Officer, Savita Meek, is on temporary transfer, and Pauline Hudson is acting in this position.

The ABRS grants for 1992 were approved by the Minister in October. These are listed later in the *Newsletter*.

The review of the Australian Biological Resources Study is being undertaken by Professor David Green, recently appointed Chief Science Adviser in the Department of the Arts, Sport, the Environment, Tourism and Territories. A request for submissions was sent to all of the people who have been involved with ABRS over the years — those on the Participatory Program Register, contributors to publications, members of committees, etc. Submissions were due by 30 November, and Professor Green will complete his report by 29 February next.

The Flora Editorial Committee met on 15 October and discussed a wide range of issues concerning planning and format.

The ABRS Advisory Committee met on 10 December. The Preferred Objectives for grants in 1993 were decided at this meeting. These are also listed later in the *Newsletter*, and a list will be circulated to all Australian herbaria. The Objectives will also be advertised in the press early in 1992. Applications will close on friday 10 April 1992.

The Flora section has been busy during the spring. Staff attended various meetings, including the Taxonomic Databases Working Group, the International Organization for Plant Information, The Forgotten Flora: a Workshop on Conservation of Non-vascular Plants (paper presented by Cheryl Grgurinovic on the conservation of macrofungi), Australasian Plant Pathology Society Conference (paper presented by Cheryl on taxonomic mycological research and teaching in Australia), and Australia's Biota and the National Interest — the Role of Biological Collections.

Alex George spent two weeks in Perth, visiting the Western Australian Herbarium, Kings Park and Botanic Garden, and the University of Western Australia, discussing various *Flora of Australia* matters with contributors and grantees, and continuing his preparation of the Proteaceae for the *Flora*. He also briefly visited the National Herbarium of New South Wales.

Paul Hattersley was asked to represent the Australian National Parks & Wildlife Service as a member of a task group concerning the Biodiversity Country Studies programme, and in this role he visited Malaysia in October and Geneva in early December.

Many people are still not using our correct address — we even receive mail addressed to Box 1252, which was two Departments ago! Our correct postal address is:-

Flora of Australia,
Australian Biological Resources Study,
Australian National Parks & Wildlife Service,
G.P.O. Box 636,
Canberra, A.C.T. 2601.

Our fax number is (06) 250 9448.

Alex George
Flora of Australia

Australian Biological Resources Study Flora Grants
Preferred Objectives for 1993

Applications will close on 10 April 1992. For further information please contact Dr Helen Hewson, Associate Director, Flora of Australia, ABRS, GPO Box 636, Canberra, ACT. 2601 (phone 06 250-9443).

Research

Vascular flora
Apiaceae (excluding *Hydrocotyle*)
Epacridaceae: *Andersonia*
Euphorbiaceae: *Euphorbia, Chamaesyce*
Fabaceae:
Crotalarieae (vol. 14)
Tephrosieae (vol. 13)
Desmodieae (except *Desmodium*) (13)
Phaseoleae (vol. 13)
Rhamnaceae
Rutaceae: *Boronia p.p.*
Scrophulariaceae
Sterculiaceae: Lasiopetalae
Stylidiaceae

Bryophytes
Brachytheciaceae

Lichens
Lecanora
Stereocaulaceae
Umbilicariaceae

Fungi
Cortinariaceae
Dothidiaceae, excluding lichenized fungi
Oomycetes

Text preparation

Vascular flora
Asclepiadaceae: *Parsonsia*
Boraginaceae: *Halgania*
Caesalpiniaceae: *Chamaecrista*
Fabaceae: Mirbelieae
Mimosaceae (excluding *Acacia*)
Molluginaceae
Myrsinaceae
Pittosporaceae

Bryophytes
Dicranaceae *p.p.*
Fabroniaceae
Leucodontaceae

Fungi
Phyllachoraceae

Alex George
Flora of Australia

Australian Biological Resources Study
Flora Grants 1992

Tasmania

Tasmanian Herbarium

Orchard, Dr A.E. Revision of *Ozothamnus* R. Br. $17,146

South Australia

Unattached

Barker, Mrs R.M. Revision of *Sida* and *Abutilon* in Australia. $25,642
Randell, Dr B.R. Preparation of *Flora* manuscripts to complete Boraginaceae (except *Halgania* & *Heliotropium*). $5,000

Western Australia

CSIRO Division of Forest Research

Bougher, Dr N.L. Taxonomic revision of truffle-like Cortinariaceae (*Hymenogaster* & *Thaxterogaster*) in Australia. $11,820

University of Western Australia

Chappill, Dr J.A. A taxonomic revision of *Jacksonia* R.Br. (tribe Mirbelieae, Fabaceae). $40,440

Western Australian Herbarium

Armstrong, Mr J.A. Taxonomy of Boronieae (Rutaceae). $33,300
Cowan, Dr R.S. Publication of new taxa of Australian *Acacia*. $12,000
Lander, Mr N.S. Revision of *Olearia* (eastern Australian species). $26,463
Maslin, Mr B.R. *Acacia* — supplementary grant to finalise complete text and illustrations. $36,000

Queensland

Queensland Herbarium

Forster, Mr P.I. Revision of Australian Apocynaceae excluding *Parsonsia* R.Br. $18,000
Forster, Mr P.I. Revision of Australian Euphorbiaceae excluding Phyllantheae, Stenolobeae,

Euphorbia s.lat., and *Adriana*. $21,960

Halford, Mr D.A. Taxonomic revision of the family Tiliaceae in Australia. $38,800

Henderson, Mr R.J.F. Taxonomic revision of Euphorbiaceae tribe Stenolobeae Benth. $22,360

Holland, Mrs A.E. *Flora of Australia* treatment of the genera *Trifolium*, *Medicago*, *Vicia*, *Lotus* (Fabaceae). $16,500

Jessup, Mr L.W. *Flora of Australia* accounts of families Sapotaceae, Ebenaceae, Symplocaceae. $22,400

Pedley, Mr L. Revision of *Desmodium s. lat.* (Fabaceae). $16,350

Reynolds, Miss S.T. Revision of tribes Coffeae, Vanguerieae and Psychotrieae (in part) of the family Rubiaceae in Australia. $29,500

Simon, Mr B.K. Text preparation of *Sporobolus* and *Crypsis* for *Flora of Australia*. $12,400

Victoria

Department of Agriculture, Burnley

Pascoe, Mr I.G. Revision of Australian Erysiphales (Fungi; Ascomycotina) $27,767

Melbourne University

Ladiges, Dr P.Y. Systematic and biogeographic analysis of *Boronia* section *Valvatae*. $20,646

Monash University

Hallam, Assoc. Prof. N.D. Taxonomic investigation of Anthocerotales in Australia. $20,303

National Herbarium of Victoria

McCarthy, Dr P.M. Systematic studies on the order Verrucariales (lichenised Ascomycotina) in Australia. $10,500

Unattached

May, Mr T.W. Catalogue and census of Australian macrofungi. $16,852

New South Wales

National Herbarium of New South Wales

Briggs, Dr B.G. Treatment of Restionaceae for *Flora of Australia*. $29,800

Brown, Dr E.A. Revision studies in the Australian Lepidoziaceae (Hepaticeae). $22,775

Conn, Dr B.J. Revisionary studies in the Australian Loganiaceae. $26,379

Conn, Dr B.J. Taxonomic revision of the Prostantheroideae (Lamiaceae). $32,620

Conn, Dr B.J. Revisionary studies in the Australian Xyridaceae. $24,596

Gross, Dr C.L. Taxonomic revision and *Flora of Australia* treatment of the genus *Correa*. $40,413

Powell, Dr J.M. Epacridaceae — treatment for *Flora of Australia*. $14,993

Ramsay, Dr H.P. Preparation of manuscripts for the family Sematophyllaceae (Bryopsida) for the *Flora of Australia*. $4,000

Ramsay, Dr H.P. Revision of the bryophyte genus *Bryum* (including key and illustrations) for Australia and its offshore Islands. $19,875

Wilson, Dr P.G. Taxonomic revision of the genus *Indigofera* in Australia. $31,920

Wilson, Mrs K.L. Systematic studies in Australian Cyperaceae. $16,280

Wilson, Mrs K.L. Revision of *Juncus* in Australasia. $17,680

Australian Capital Territory

Australian National Herbarium

Craven, Mr L.A. Systematic studies in *Melaleuca* (Myrtaceae). $32,018

Eichler, Dr Hj. Taxonomic revisions in Ranunculaceae, Zygophyllaceae and Apiaceae. $15,500

Lazarides, Mr M. *Flora of Australia* and DELTA accounts of Chloridoideae, Poaceae. $53,534

Palmer, Ms J. *Flora of Australia* treatment of Amaranthaceae (*Alternanthera*, *Amaranthus* and *Gomphrena*). $20,677

Australian National University

Elix, Dr J.A. A revision of the lichen family Parmeliaceae in Australia including complete *Flora of Australia* text. $17,780

Watson, Dr L. Poaceae-Arundinoideae: DELTA treatment, and preparation of account for *Flora of Australia*. $15,542

Watson, Dr L. Automated taxonomic revision and keys for Poaceae-Pooideae, for *Flora of Australia*. $38,006

Unattached

Adams, Mr L.G. *Flora of Australia* treatment, completion of Gentianaceae. $5,000

Bruhl, Dr J.J. Automated taxonomic revision and keys for Phyllantheae, Euphorbiaceae, for the *Flora of Australia.* $35,178

Overseas

Botanical Museum, Uppsala, Sweden

Moberg, Assoc. Prof. R.J. Studies of Australian Physciaceae. $13,000

Natural History Museum, London, UK

Galloway, Dr D.J. A taxonomic revision of *Pseudocyphellaria, Sticta* and *Dendriscocaulon* (Peltigerales) in Australia. $11,000

University of California, Davis, USA

Webster, Professor G.L. Revision of *Phyllanthus* in Australia in collaboration with Dr J. Bruhl. $5,998

Unattached, Canada

Murray, Dr B.M. Andreaeaceae of Australia. $20,033

Alex George
Flora of Australia

Federation of Australian Scientific and Technological Societies Inc.

Annual general meeting, November 1991

You have heard it all before. It was one of those mornings when you were sure that you would gets lots of work done, and moments later you were heading off to a meeting ...

The president's report (a rerun of the report to the board in August) stressed the need for professional accreditation (enter, stage left, the Australian Institute of Biology). Professor Tony Wicken continues: "Standards in research should be maintained by peer review by discipline committees elected by the professional societies." Presumably, peer review via refereed journals and stiff competition for limited research funds are not sufficient.

Financially, FASTS seems to be in reasonable shape, but delegates at the meeting had to extricate the details from the treasurer. Much of the federation's funds are raised in the form of dues from the member societies such as ASBS, which raises the issue of what value do we get for our contribution? FASTS presents a more-or-less unified and concerted front, lobbying for and on behalf of science and technology. Another benefit is that the mere presence of FASTS tends to remind all of its member societies that we (the discipline of our choice, our professional society ...) are not islands, and (implicitly) that we should be working to improve our own interests but not at the expense of our fellow disciplines (despite the government's "divide and rule" attempt to do just this, by calling on societies to present their priorities for research in Australia).

David Kemp, shadow minister for education and the opposition's adviser on science, also made a presentation. He stressed the opposition's predilection for "the individuals' rights" (hmmm), and its aim to "free up bureaucratic impediments to business", which would lead (they suggest), amongst a host of other things, to more R&D. Unfortunately, he dismissed an astute observation from the "floor" that: technologically successful and scientifically progressive countries such as Germany (well, at least half of it!) succeeded in getting industry involvement in R&D (through to basic research) by actively encouraging industry (with dollars) to do R&D; and that this in turn has a significant flow-on to university-based research; and that Australia should follow this approach to get our industry involved. (Contrast this with the requirement here in Australia, where research establishments must now achieve a significant percentage of outside funding — research chasing dollars instead of dollars chasing research.) Maybe Kemp wants to stay in the shadows.

The main role that FASTS fulfills is as a political lobbyist in the arena of science and technology. If you think that ASBS should have a particular stance (supportive, seeking change, etc.) in relation to FASTS' policy, you should contact our representative, Judy West at CANB.

Jeremy Bruhl
Research School of Biological Sciences
Australian National University

Australian Botanical Liaison Officer

I departed from Australia on 7 July to take up my position as the 1991/92 ABLO, travelling via the Yukon and Alaska (dipping my toe into the Arctic at Tuktoyaktuk), and arriving in England on monday 12 August. This gave ample time for me to be tutored by Greg Leach as regards the duties of the ABLO, before taking over officially on the first monday in September.

Accommodation wasn't a problem. I stayed with Bob Johns for the first four days, and then moved into the first flat that I looked at in Richmond on the friday. The flat is only about 25 minutes walk from the herbarium, and I'm yet to catch a bus! Banking was a bit of a problem. Although an account was opened well before I left Australia, the bank was reluctant to provide me with a cheque account — despite the deposit of the Commonwealth grant and a considerable portion of my own savings. It took four or five weeks before this was resolved.

Apart from my participation in the staff vs students cricket match, I can think of no other major events of general interest. Perhaps I could discuss some squash results, although on this point I think I will only record that I'm more of a diplomat than my predecessor!

In fact, there are two major projects that are nearing completion and which I am sure are of interest. Both *Vascular Plant Families and Genera* (ed. R.K. Brummitt) and *Authors of Plant Names* ... (eds R.K. Brummitt & C.E. Powell) are on course for publication early in the new year (February seems likely).

David Symon and Sally Reynolds have visited Kew during my stay. Requests have been steady, but at least to date they have not been overwhelming, and I'm pleased to say they have rarely been too difficult to service.

I have just had a brief trip (21–24 November) to Ireland, where I delivered two lectures ("Australian arid zone plants" in Dublin, "Royal Botanic Gardens, Melbourne" in Belfast) to members of the Irish Garden Plant Society. Things were a bit hectic, but there was time to examine various collections of Compositae in both TCD and DBN. The Irish are renowned for their hospitality, and it seems to be well deserved. Charles Nelson and others such as Mike and June Snowden looked after me extremely well. Mike is head gardener at Rowallane Gardens near Belfast, and he showed me around them on the saturday morning. He also introduced me to "Black Bush" whiskey which, along with that black stuff with the froth on top, must be one of the better Irish products.

I have no firm plans to visit any other herbaria at this stage, but I will probably visit Edinburgh sometime in May/June, on my way to the Orkneys for a short break. I will also be travelling to Stockholm (perhaps in January/February) in connection with some cladistic work on the Australian Inuleae; and at some stage I must examine some daisies in the de Candolle herbarium, Geneva. Towards the end of my stay I will almost certainly visit Paris.

Philip Short
Kew

A.S.B.S. Melbourne Chapter

A.S.B.S. Melbourne Chapter seminars have returned home. They will be held at 6 pm on the first monday of each month in the Astronomer's Residence, behind La Trobe's Cottage (100 m west of the National Herbarium of Victoria, corner of Birdwood Ave and Dallas Brooks Drive, South Yarra). Refreshments will be available from 5.30 pm. All visitors and members are welcome.

In the first half of the year, we feature dinosaurs and their dinner, the latest methods in biogeography, a horticulturalist's perspective on taxonomy, and the discovery of a remarkable flora in what remains of the grasslands west of Melbourne.

Seminar Programme, March-June 1992

Monday, March 2
Tom Rich
Museum of Victoria
"Polar Cretaceous biota of south-eastern Australia"

Monday, April 6
Pauline Ladiges
School of Botany, University of Melbourne

"Historical biogeography: methods of data analysis"

Monday, May 4
Bill Molyneux
Australflora Nursery
"A horticulturalist amongst taxonomists"

Monday, June 1
Geoff Carr
Ecological Horticulture
"Is there an endemic flora on the Victorian volcanic plain?"

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

Tim Entwisle
Convener

International Oganization for Plant Information

A meeting was held in Canberra on 19–20 September to discuss the objectives, structure, government and operation of the proposed Organization. It was attended by 49 people, from 33 institutions in 11 countries, as well as unattached participants. The Organization (IOPI) was formally established on 20 September 1991, with a Constitution and By Laws being adopted. The Interim Council set up at the Kew meeting in June (*ASBS Newsletter* **68**: 30-31, Sept. 1991) became the Foundation Council and will hold office until the next meeting.

The objectives of IOPI, as set out in its Constitution, are:-

1) to promote and prepare, as expeditiously as possible, a series of integrated, dispersed, computerized databases summarizing the basic taxonomic information (bearing in mind the basic requirements of freedom of taxonomic research and opinion), and biological and other attributes (in particular, information relating to their utilization and conservation) of all kinds of plants in the world [plants being defined as those covered by the International Code of Botanical Nomenclature];

2) to document the data in such ways as shall make them most readily accessible to users of all kinds, in all regions, and in such formats as shall seem most expedient to the governing body of IOPI;

3) thereafter, to maintain the data in an up-to-date form and continue to render them accessible in accordance with 1) and 2) above.

The first project will be a checklist of the vascular plants of the world, with the aim of completing the initial list within five years.

Membership of IOPI will consist of Participating Centre (PC) Members, Individual Members, and Invited Members. PC and Individual Members will be required to be active participants in the work of IOPI, either as representatives of Participating Centres or as Members in their own right. Nominations for PC or Individual membership may be submitted in writing by two Members of IOPI, and the names will be submitted by Council for election at a General Meeting by a simple majority of the members present.

Invited Members will be individuals, recognized by the governing body of IOPI as capable of contributing in some way to the work of IOPI although not necessarily participating directly in its activities as such. Invited Members will be nominated by the governing body of IOPI. There is no membership fee. For the first year the membership will consist of members of the Foundation Council, the Checklist Committee, and the Working Groups.

The Foundation Council is:- Sir John Burnett, Oxford, UK (Chairman); Dr Ana Anton, Cordoba, Argentina (Vice-Chairman); Mr Alex George, Canberra, Australia (Secretary); Prof. Pieter Baas, Leiden, The Netherlands; Dr Kay Beese, European Commission, Brussels, Belgium; Dr Frank Bisby, Southampton, UK; Dr Dmitry Geltman, St Petersburg, USSR; Dr Ana Maria Giuletti, Sao Paulo, Brazil; Prof. Werner Greuter, Berlin, Germany; Dr Patricia Holmgren, New York, USA; Prof. K. Iwatsuki, Tokyo, Japan; Prof. Bengt Jonsell, Stockholm, Sweden; Dr Edward Kennedy, BIOSIS, USA; Prof. Gren Lucas, Kew, UK; Dr P. Maas, Utrecht, The Netherlands; Prof. Philippe Morat, Paris, France; Dr Nancy Morin, Missouri, USA; Dr L. Skog, Washington, USA; Dr Rodolphe Spichiger, Geneva, Switzerland; Prof. Clive Stace, Leicester, UK; Dr David Sutton, London, UK.

Following a submission made earlier, the IUBS has recommended that admission of IOPI as a Commission be formalized at the 25th General Assembly in 1994, and that IOPI be accepted as part of the IUBS Biodiversity Programme. IOPI will also seek affiliation with IAPT.

A Checklist Committee has been established, charged with the production of a checklist of accepted names of vascular plants and a minimum data set. Its Chairman is Dr David Hunt, Kew; Mrs

Karen Wilson, National Herbarium of New South Wales, is a member. Three Working Groups were set up to assist the Committee. They are the Data Definition and Standards Working Group, chaired by Dr Frank Bisby, of which Dr Les Watson, RSBS, ANU, Canberra, is a member; the Taxonomic Resources Network Working Group, chaired by Dr Nancy Morin, Missouri; the Information Systems Working Group, chaired by Dr Catherine Zellweger, Geneva, of which Dr Diedre Jinks, UTS, Sydney, and Dr David Green, Canberra, are members. There is also the *ad hoc* Potential Users Group, chaired by Dr Kay Beese, Belgium, and a Finance Advisory Group, chaired by Dr Scott Peterson, Beltsville, USA.

The Information Systems Group will also plan a strategy, system and network suitable for the broad, long-term objectives of IOPI, for consideration by the Council at its next meeting.

The next meeting of IOPI will held in Xalapa, Mexico, probably in October 1992; the precise dates are yet to be confirmed. Anyone, or any institution, wanting further information or wishing to apply for membership should contact the Secretary, Alex George, Australian Biological Resources Study, GPO Box 636, Canberra, ACT. 2601; fax (06) 250-9448; phone (06) 250-9440.

Alex George
Flora of Australia

The International Working Group on Taxonomic Databases for Plant Sciences

TDWG7 meeting, Canberra 21 & 23 September 1991

The following is a brief summary of the 7th meeting of the International Working Group on Taxonomic Databases for Plant Sciences. Hopefully, the official minutes of this meeting will be available early in 1992.

Background

To quote from the Constitution of TDWG:- "The International Working Group on Taxonomic Databases for Plant Sciences (abbreviated as TDWG) is a not-for-profit scientific and educational association formed to establish international collaboration among botanical and plant taxonomic database projects, so as to promote the wider and more effective dissemination of information about the world's heritage of plants, fungi and algae for the benefit of the world at large. To achieve its goals, TDWG:- (a) develops and promotes standards and guidelines for the recording and exchange of data about plants; (b) promotes their use [of such standards and guidelines] through publications; (c) acts as a forum for discussion through holding meetings and through publications such as a newsletter; and (d) undertakes any other activities that are judged useful towards these goals."

To date, TDWG has published (via the Hunt Botanical Institute) one standard, the ITF standard for exchange of data between botanic gardens, has a number of other standards in press, and others under consideration. Annual meetings are held in different parts of the world, sometimes in conjunction with other international meetings.

TDWG is a voluntary organization, so it is not very fast-moving, but it is taking a worthwhile role in communicating and preparing standards and guidelines relevant to many botanists' work. Australian herbaria should consider taking membership in TDWG (only $US50.00 per annum to the Treasurer, G.F. Russell at the Smithsonian Institution), and plant taxonomists should be aware of the standards and guidelines being developed. TDWG actively seeks participation; and Australian developments are leading the field in areas such as herbarium databases, so there is lots of room for involvement.

As distinct from the report published in *Erinyes* recently (November 1991), the correct name for the association is as given above. TDWG is a commission of IUBS, and therefore has an IUBS commission name, but this is for internal IUBS use only.

Summary of Plenary session

1) Two points of interest from the Chairman's report (Frank Bisby):- (i) there is a need to extend and develop international support and assistance for TDWG; and (ii) there is a need to make sure that individuals offering to assist various TDWG projects actually have sufficient resources to carry out those tasks. Some projects have not been completed because individuals have not always been able to devote enough time or resources to these projects.

2) Newsletter Editors' report (Catherine Zellweger). Although TDWG was prepared to present

three issues of the *Newsletter* per year, Catherine Zellweger noted that only one had been produced for the last 12 months because of the shortage of contributions.

3) The Standards Editors' report (Ellen Farr & Jim Beach) informed the Meeting that the standard for Plant Names in Botanical Databases (collated by Frank Bisby) has been submitted for publication. Work on The Plant Occurrence and Status Scheme (POSS) (Leon *et al.*) standard has stopped — Roger Hnatiuk and Mike Lock have taken over the co-ordination of this subgroup. The XDF (data exchange format standards) subgroup is on hold until the ISO standards are evaluated, to avoid duplication of effort. The world geographical scheme for recording plant distributions (Sue Hollis & Dick Brummitt) has been submitted for publication. A report on the Latin American meeting on botanical data bases was presented to the Meeting.

4) Frank Bisby presented a report on the CODATA Working Group for standardization of terminology of biological data. There was some uncertainty as to how broad the usage of this database will be. Therefore it was concluded that the development of enlarged dictionary standards will be important to the development of CODATA.

5) Delphi GPSIS symposium report (Frank Bisby & Rusty Russell) — the Global Plant Species action group is to be formally wound-up and to be replaced by IOPI (International Organization for Plant Information).

A number of working groups met to discuss standards and guidelines that could be formulated in a range of areas. These groups usually have a convenor who prepares a discussion paper or proposal for consideration by the group. When the convenor is not able to be at the meeting another person presents their views for them.

Summary of Working Groups sessions

1) Habitats (convenor Mike Lock, Kew) — to consider standards for the entry of ecological information into databases. A paper is to be prepared in time for consideration by membership before or by the next meeting. This standard (guideline) is for taxonomic databases, not for ecologists who have more detailed information. However, it was meant to be understandable and exchangeable with ecologists. The major weakness of this proposed Standard is that it does not follow the usual habitat descriptors as used in Australasia. Many participants questioned the value of the "broad-brush" terminology proposed.

To ensure that Australian views are represented, Australian taxonomists and ecologists should be involved with the development of such a standard.

2) Forum on Type & Lectotypification databases (convenor Ellen Farr, Smithsonian Institution). Progress on databasing of type collections was discussed, and members reported on the progress within their own institutions.

Linnaean Types:- David Sutton (BM) reported on the project by the Linnaean Society and BM to database all Linnaean type specimens, and eventually all Linnaeus' specimens;

USA National Type Register:- Jim Beach (Harvard) reported that major North American herbaria are co-ordinating a distributed database (on INGRES) of all type specimens held. There is also a proposal to computerize the "Gray" card index;

Southern USA herbaria:- Robert Haines (University of Alabama) reported that a network of herbaria throughout the south are databasing all of their specimens, so types will be included;

Names In Current Use (NICU):- Werner Greuter reported that type registers are being prepared as part of NICU. Complete records of types of Linaceae are already held; other groups for which information is being accumulated include Pinaceae and Eriocaulaceae;

Index Kewensis:- Gren Lucas (Kew) reported that the CD-ROM version of I.K. will be produced by Oxford University Press, and will be available (for approx. £1000) in 1992;

The Bishop Museum has a Type database 96% complete.

3) "Generalized Descriptors" (formerly "Life Form") (convenor Richard Pankhurst, Edinburgh). Richard asked members to suggest a list of about 20 general descriptors useful for each major plant group. A list of 70 characters was compiled by ranking of importance from a larger list. Co-ordinators for bryophytes, algae, fungi and lichens are required. It was not clear how or when these descriptors would be applied, and a number of members challenged the need for such an abbreviated list. Richard will publish progress reports.

4) Accessions [Exchange Format] (convenor Jim Beach, Harvard University). The aim is to define a set of data items for exchange format. It was agreed that it is easier to standardize what data are to be exchanged than it is to try to make people standardize their databases. Accurate data definitions are thus required to capture data from other institutions.

It was concluded that it would be useful to

have a document on accession standards that would act as a guide for the design of new databases. Useful and preferred elements of a database could be defined in such a standard. The standard will follow the HISPID standards, and will be circulated to interested members within the first six months of 1992. Contact Jim Beach at Harvard if you wish to contribute &/or be kept informed.

5) Uses (acting convenor Mike Lock, Kew) — a standardized list of descriptors for plant uses, primarily for databases concerning the economic use of plants, was discussed. This list has ten top-level categories; to these are added additional information. The higher levels of the standard are recommended, but lower level categories are to be as examples, for guidance only. A standardized list of plant parts will be added to this list. The final report will be available for consideration at the next meeting. It was interesting to note that no-one at the meeting appeared too sure of how to use this list!

6) Data Dictionary (convenor Rusty Russell, Smithsonian Institution) — essentially a dictionary of terms. Since almost all subgroups required a dictionary of terms for their specific working groups, it was decided that Russell would collate all of the dictionaries from these individual subgroups. The first draft of this dictionary would be available before the next meeting. A lengthy and frequently tedious discussion of the validity of producing a data dictionary without a prior data model occupied much of the session. However, the short-term aim of this working group was to produce a list of terms.

7) Phytogeography (acting convenor Mike Lock, Kew) — discussion of the progress of this working group was limited because Hélène Falaise (Paris), the main proponent, was not able to attend this meeting. The standard proposed is the Tahktajan system (as used at Paris). Since maps were not provided, it was difficult to have a meaningful discussion. However, it was agreed that it would be useful for this group to compare the major global systems, producing a synonymy and an explanation of the criteria used in each. It was concluded that the use of standard global phytogeographic regions would be preferable, but that it would be unrealistic to endorse any current system or to develop one, so the role of this group is as a forum for exchange of information on phytogeographic systems.

8) Computer Images sub-group/forum (Pictures & Images) (convenor Mike Dallwitz, CSIRO, Canberra) — a discussion of current terminology and software was held. Standards required for image format and ways of linking images were also discussed. The question of standardization is not that important, because these can be translated. There is one formal standard — the JPEG standard (Joint Photographic Experts Groups). This is likely to be relevant and appropriate for taxonomists. The ADONIS system for facsimile images for journals and the SDF standard for spatial data might contain relevant information. It was agreed that TDWG is an appropriate forum for exchange of information. When standards are published by other bodies, it might be useful for TDWG to make recommendations. Dallwitz agreed to co-ordinate the presentation of introductory material to imaging terminology, software and hardware, and that this would be published in the *TDWG Newsletter* (David Bedford & Diedrie Jinks have begun the document).

9) GIS (convenor Bill Loader, UK) — Geographic Information Systems. Three objectives:- (i) to investigate existing standards and make recommendations; (ii) to research working practices and make recommendations about these (e.g. confidence levels of such fields as altitude, latitude, etc; how values in fields are determined, by whom and when; and consistency checking of values in fields); (iii) to investigate the possibility of producing an index of information sources (e.g. of historic maps — particularly in digital form; collectors' itineraries; historic or alternative place names). It was agreed that it would also be useful if an introductory paper explaining the difference between GIS and CAD was written.

10) Data Models (temporary convenor Catherine Zellweger, Conservatoire et Jardin Botaniques, Chambesy, Switzerland). This working group considered the role (if any) of the sub-group, including the role of TDWG. It was agreed that the subgroup had a valid role, which would include the collation of all published data models within taxonomic models, so that assistance could be provided for those needing to develop data models. This information will be prepared before the next meeting, and is to be co-ordinated by the new convenor, Christine McMahon of Missouri Botanical Garden.

Election of Officers for 1991/2

Chairman: Frank Bisby
Vice Chairman: Lorrain Giddings
Secretary: James Zarucchi
Assistant Secretary: Wayt Thomas
Treasurer: George (Rusty) Russell
Newsletter Editors: Hervé Burdet, Bertrand von

Arx, Catherine Zellweger
Assistant (regional) Secretaries:-
Xu Kexue (Asia)
Barry Conn (Australia)
Michael Lock (Britain)
Francisco Pando (Europe)
Maria de Jesus Ordóñez (Latin America)

Election of Representative to IOPI Council:-
George (Rusty) Russell

Time and place of next Meetings:-
8–13 October 1992, Xalapa, Veracruz, Mexico — with an introductory session before the workshop for the large number of new members that are expected.

September/October 1993, Washington, USA, to coincide with the American Botanical Society Systematic conference to be held in the first week of October 1993 at MO.

There will also be a "shopwindow" display at the International Botanical Congress in Tokyo, 1993.

Barry Conn and David Bedford
National Herbarium of New South Wales

NOTICES

Request
Naturalized Strandplants

At this year's joint symposium in Auckland I presented a poster about how introduced strandplants have spread along Australian coasts. It was an extended version of the poster originally shown at the symposium and open forum in Canberra last year. To help me keep track of further colonizing events, I would like to seek the co-operation of beachcombers prepared to report occurrences (abundance and habitat) of the following species:-
Arctotheca populifolia (Asteraceae)
Cakile edentula and *Cakile maritima* (Brassicaceae)
Euphorbia paralias (Euphorbiaceae)
Gladiolus gueinzii (Iridaceae)
Hydrocotyle bonariensis (Apiaceae)
Senecio elegans (Asteraceae)
Tetragonia decumbens (Aizoaceae)
Thinopyrum junceum (syn. *Elymus farctus*; Poaceae)
Trachyandra divaricata (Liliaceae)

The first four of these species are of particular interest to me. *A. populifolia* occurs in two forms:- one with smooth-margined, ellipsoid leaves, which occurs along the east coast as far south as Flinders Island; and the second one with more or less scalloped, deltoid leaves, found in Western Australia and in South Australia as far east as the South East region. Hence, observations of this species in Victoria and Tasmania would be particularly valuable and a voucher specimen most welcome. The two *Cakile* species are often confused when not in fruit, and a voucher specimen would be needed if there is any doubt about the identification. *E. paralias* is very uniform over its whole range, and given its habitat characteristics cannot be confused with related species.

If you would like further information, please contact:-
Petrus C. Heyligers
Tel (06) 251-1723
or leave a message at
CSIRO Division of Wildlife & Ecology,
Lyneham, ACT
Tel (06) 242-1600
Fax (06) 241-3343

Petrus Heyligers
Cook, A.C.T.

Australian Systematic Botany

Volume 4 Issue 1 has recently been published, and contains 17 papers from the "Austral Biogeography" symposium of the 9th meeting of the Willi Hennig Society as well as the ASBS meeting "Biogeography at the Crossroads", both held in August 1990. This issue has also been published as a special book version, with the title *Austral Biogeography*.

Publication of the first two issues of *ASB* has been delayed because the company used for typesetting experienced financial difficulties. This was most unfortunate, given the effort that the authors and editorial staff put into getting Issue 1 going after the conferences. *ASB* has now been transferred to another typesetting company, and we are back on schedule. Issues 2 and 3 have come out close together, and Number 4 will be out as sched-

uled for December 1991.

Because of the great support that the journal has received from authors, we shall be producing six issues per year from Volume 5 (1992) onwards.

Pauline Ladiges
Chair, Editorial Committee

Plant taxonomists online

There is now a worldwide directory of email (electronic mail) addresses of plant taxonomists and herbaria. So, if you have access to email through your computer system (such as the computers at CSIRO and all Australian universities, for example, have through AARNET), then you can contact colleagues interstate or overseas. This system allows you to transfer data as well as to send messages. For example, the text of the conference abstracts in this issue of the *Newsletter* were transferred from New Zealand to Australia via email, which was much faster than posting a computer disk.

If you are interested in being placed on the directory, then send an email message (you can include your postal address, and phone and fax numbers) to "JMYGATT@bootes.unm.edu.au", and Jane will put you on the list and send you a current directory listing.

Jeremy Bruhl
RSBS, ANU

Directory of Pacific Botanists

Since 1987 the Scientific Committee on Botany of the Pacific Science Association has undertaken to update the Directory of Pacific Botanists. The last Directory of Pacific Botanists was completed in 1984, based on a survey carried out in 1983. By 1990, it was clearly time to update the information in the previous Directory. A new questionnaire was developed that would provide more detailed information than was obtained in the earlier version. This was sent to all those people who had identified themselves as having an interest in the botany of the Pacific.

I am currently checking the Australian entries in the Directory. Relevant sections will be circulated to all Australian herbaria and other institutions identified by the Directory as having staff interested in Pacific botany. I would be grateful if those listed in the Directory could check all names, affiliations, and addresses for accuracy. It is equally important to check for errors of omission, since this directory will be in use for a relatively long time.

It is important that any colleagues who have not filled out the relevant questionnaire should do so immediately. The questionnaire is in four parts:- (1) name and address; (2) the taxonomic groups of organisms with which you work; (3) the approach that you take towards the organisms that you study; and (4) the geographical regions in which you work.

All completed questionnaires, corrections, and/or other relevant information must be returned to me, no later than 31 January 1992.

Barry Conn
Australian member of Standing Committee for Botany
Pacific Science Association

Fenner Conference on the National Biodiversity Strategy

As part of the public assessment of the commonwealth government's draft National Strategy for the Conservation of Biological Diversity, the Department of Arts, Sport, the Environment, Tourism and Territories (DASETT) is hosting a conference and symposium to discuss particular aspects of the strategy.

Associated with the DASETT meeting, the Ecological Society of Australia has been invited by the Academy of Science to hold a Fenner Conference, and to organize workshops on particular topics or areas covered by the national strategy. The meeting is to be held on 11–13 March 1992 at the Academy of Science in Canberra.

I understand that the planning committee is intending to invite ASBS to participate. Because of the limitations of the theatre, there will be restricted numbers of attendees. The plan is to invite at least 60 independent scientists to interact with participants from the various state and federal government departments and others such as conservationists.

If you would like to be involved in the conference and to participate in the workshops, please let me know. There are no registration fees, but there are no funds available for transport or support

either. The timing is such that no further notice will appear in this *Newsletter*. Thus, I shall have to arrange to send organizational details to those who contact me, once DASETT finalizes its arrangements.

I see this as an excellent opportunity for ASBS to play an active role in some of the decision-making about conservation of biodiversity. This national strategy is likely to be a powerful piece of government legislation that will affect many of our activities, whether they be scientific or recreational. Most aspects of our systematic work have impact on or are directly providing information for biodiversity-related issues, including of course the data held with herbarium specimens.

Judy West
President, ASBS Inc.

Conferences

Flora Malesian Syposium

Jokyakarta, Indonesia
7-12 September 1992

The second Flora Malesian Symposium will be held from 7-12 September 1992 at the Garuda Hotel, Jokyakarta (Yokyakarta), Indonesia. The two major themes to be discussed at this symposium will be taxonomy and biodiversity, with an emphasis on action rather than theory. For further information contact:-

Dr M. Rifal,
Herbarium Bogoriense,
Jl. Raya Juanda 22-24,
Bogor.
Indonesia

Pacific Botany for the 21st Century

Okinawa, Japan
1993

For further information contact:-

Dr S.H. Sohmer,
Chairman, Standing Committee for Botany,
Pacific Science Association,
P.O. Box 17801,
Honolulu, Hawaii 96817.
USA

Barry Conn
Secretary, ASBS Inc.

Australian Systematic Botany Society

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Personal News

Reports

Reviews

General

Some of the *Xanthorrhoea* designs used on the ASBS mugs

AUSTRALIAN SYSTEMATIC BOTANY SOCIETY

History of Systematic Botany in Australasia

Edited by P.S. Short. A4, case bound, 326pp. A.S.B.S., 1990.
Members $40; non-members $50. Postage $8.

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

Systematic Status of Large Flowering Plant Genera

A.S.B.S. Newsletter Number 53, edited by Helen Hewson. 1987. $5 + $1.10 postage.

This Newsletter issue includes the reports from the February 1986 Boden Conference on the "Systematic Status of Large Flowering Plant Genera". The reports cover: the genus concept; the role of cladistics in generic delimitation; geographic range and the genus concept; the value of chemical characters, pollination syndromes, and breeding systems as generic determinants; and generic concepts in the Asteraceae, Chenopodiaceae, Epacridaceae, *Cassia*, *Acacia*, and *Eucalyptus*.

Flora and Fauna of Alpine Australasia: Ages and Origins

Edited by B.A. Barlow. A.S.B.S. & C.S.I.R.O., 1986. $21 + $5 postage.

The alpine environments of Australia, New Guinea, and New Zealand differ from each other in terms of topography, genesis, climate, and biota. They also contrast strongly with alpine habitats in the northern hemisphere. Palaeoclimatology, palaeobotany, biogeography, ecology, and plant and animal systematics have been used here to give an understanding of the biohistorical relationships of these isolated islands of alpine terrain in the southern hemisphere.

Evolution of the Flora and Fauna of Arid Australia

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

This collection of more than 40 papers will interest all people concerned with Australia's dry inland, or the evolutionary history of its flora and fauna. It is of value to those studying both arid lands and evolution in general. Six sections cover: ecological and historical background; ecological and reproductive adaptations in plants; vertebrate animals; invertebrate animals; individual plant groups; and concluding remarks.

Australian Systematic Botany Society Newsletter

Back issues of the *Newsletter* are available from Number 27 (May 1981) onwards, excluding Numbers 29 and 31. Here is the chance to complete your set. Cover prices are $3.50 (Numbers 27-59, excluding Number 53) and $5.00 (Number 53, and 60 onwards). Postage $1.10 per issue.

Also available are sweaters ($25), t-shirts ($15), mugs ($8 each, or $42 for a six-pack), and scarfs ($20).

Send orders and remittances (payable to "ASBS Inc.") to:

Helen Thompson or Helen Hewson
A.S.B.S. Sales
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G.P.O. Box 636
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add the Australian country code 61 and omit the leading zero of the area code.

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Ph: (08) 2282311	Ph: (07) 8779328	Ph: (002) 202635	Ph: (070) 921555
Fax: (08) 2231809	Fax: (07) 3716655	Fax: (002) 202186	Fax: (070) 923593
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Fax: (089) 323849	Fax: (06) 2818312	Fax: (09) 3670515	Fax: (070) 913245

This list will be kept up to date, and will be published in each issue.
Please inform David Bedford (NSW) of any changes or additions.

The Society

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

Membership

Membership is open to all those interested in plant systematics. Membership entitles the member to attend general meetings and chapter meetings, and to receive the *Newsletter*. Any person may 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, or as two typed copies with double-spacing.

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

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

Notes

ASBS annual membership is $22 (Aust); full-time students $12. Please make cheques out to ASBS Inc., and remit to the treasurer. All changes of address should be sent directly to the treasurer, as well.

Advertising space is available for products or services of interest to ASBS members. Current rate is $100 per full page, $50 per half-page or less. Contact one of the *Newsletter* editors for further information.

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Cover

David Mackay

Austral. Syst. Bot. Soc. Newsletter 69 (December 1991)

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