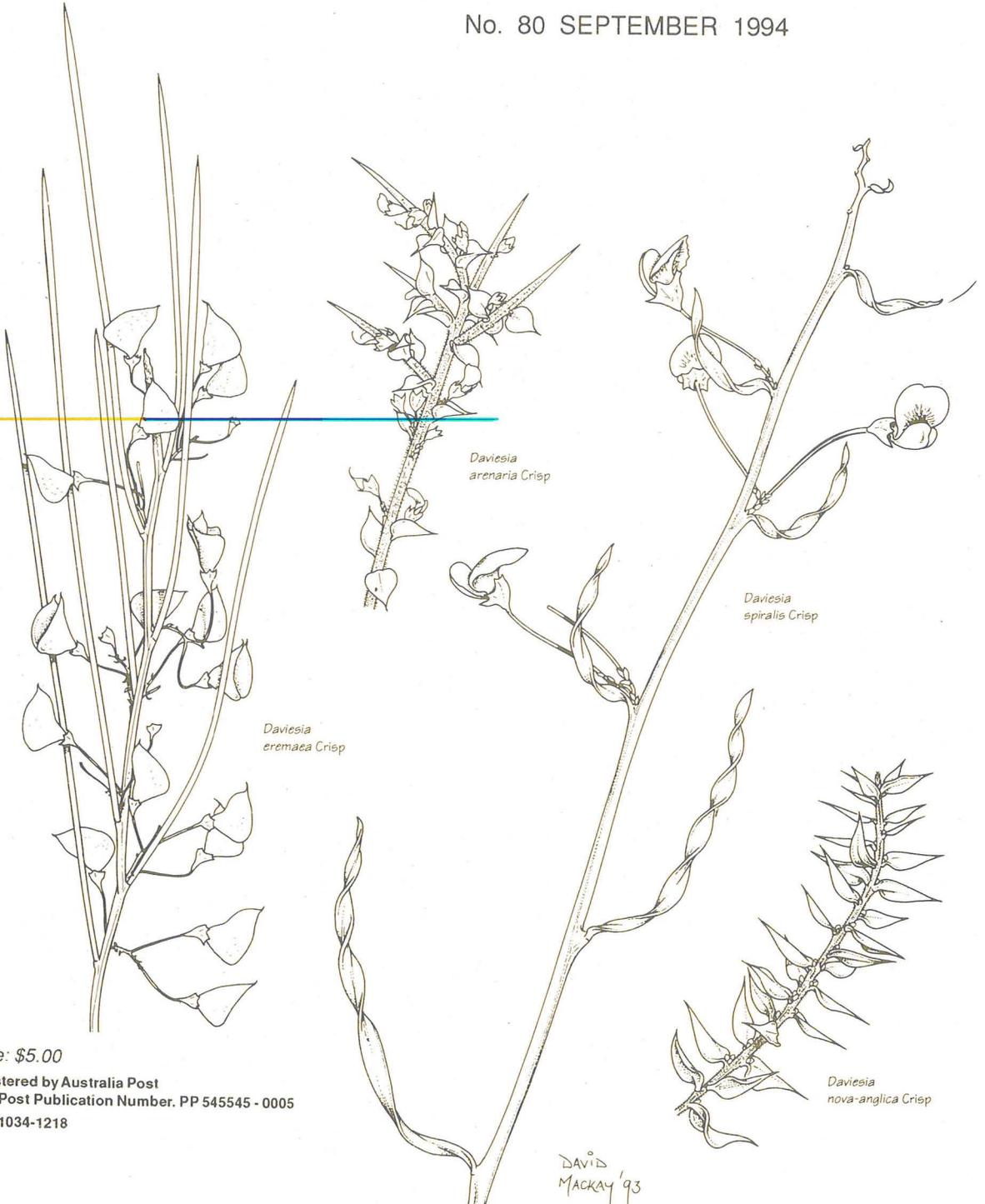




# Australian Systematic Botany Society NEWSLETTER

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## FROM THE PRESIDENT

I have decided to start this column in order to better inform the membership about the activities of Council, matters of general interest to ASBS, and to float ideas for comment. On the last, I invite your comments, criticisms and suggestions. Some of the things I mention will be covered elsewhere in this issue of the *Newsletter*, e.g. in the minutes of the General Meeting; in such cases, I am giving either additional details or my own interpretation. In short, this column presents personal views rather than official statements from Council. Finally, don't expect all of the columns to be as long as this one! I have a lot to say this time, because we have just had both Council and General meetings.

### **We have withdrawn from FASTS**

Elsewhere in this *Newsletter* you will find a binding resolution from the 16th General Meeting that the Society withdraw its membership of FASTS. I have been obliged to inform FASTS of this, and to withhold our subscription, for which we recently received a renewal notice. This decision is not a bolt from the blue. At the General meeting held in Hobart last year, several members expressed serious disquiet at the lack of visible return for our significant investment (more than 7.5% of our income from subscriptions). In effect, that meeting put FASTS on notice.

During the following 18 months, the main activity within FASTS appeared to be a struggle for power among the upper echelons. Hearing of this earlier this year, I wrote to FASTS informing them that ASBS would withdraw unless they improved their act quickly. Although FASTS has now replaced its executive director, and although they asked us to "wait and see" for improvements in their performance, the ASBS General Meeting has meanwhile carried out this action. Some of the reasons are given in the minutes of the General Meeting. They include lack of perceived benefit to ASBS, political infighting within FASTS, public conflict between the executive director and the science minister, and

the financial difficulty that our Society has experienced lately.

Personally, I have misgivings about this action. In a time of shrinking budgets, scientists need professional lobbyists to press our cause with government. We, as a small scientific society, cannot do this lobbying effectively on our own. But it is clear that our membership needs convincing that an organisation such as FASTS can act effectively on our behalf. The vote at the General Meeting produced only a small majority in favour of withdrawal, so it would not require many members to change their minds in order to reverse this decision. I will place FASTS membership on the agenda of the next meeting (in Canberra in September 1995), and I will invite a FASTS representative to come along and try to convince us that we should rejoin. Hopefully we can persuade them to submit something to the *Newsletter* also.

### **Australian Biodiversity Council**

Out of one umbrella organisation, and into another. Recently a meeting involving interested societies (including ASBS) decided to establish an Australian Biodiversity Council. Although this organisation will in part lobby government, possibly achieving increased funding for our research, this is a different kind of organisation from FASTS. Its primary aim is to promote a scientific basis for decisions affecting biodiversity, and to make the expertise of qualified biologists available to achieve this. Moreover, an ABC will concern only that branch of science close to our own interests, being less monolithic than FASTS, and therefore should be more responsive to our needs. I think it deserves our strong support, and, in expression of our goodwill, Council has voted to give them \$1.50 per member to help them set up an organisation. At this stage, there is no ongoing financial commitment to ABC. Tim Entwisle is our interim representative, and he will keep us posted on developments.

### Australian "AIBS"?

Many of you will be aware of my long-standing interest in setting up an Australian systematic biology society (see *Newsletter* 55: 3—5, June 1988). I now feel that we shouldn't try to change ASBS to achieve this — ASBS works well the way it is, and if we try to change it then some members would probably start another group to achieve ASBS's current aims. So, the other alternative is to start something new, and I have been thinking along the lines of an Australian "AIBS" (from the American Institute of Biological Sciences). This would be an umbrella organisation under which the relevant Australasian societies would meet annually, e.g. ASBS, Ecological Society of Australia, Australian Entomological Society, Australian Society for Phycology & Aquatic Botany, etc. In fact, ASBS started out this way, meeting under the auspices of ANZAAS, but ANZAAS gradually became less relevant, and we began meeting separately.

Under an "AIBS" format, each society preserves its independence, with its own program and agenda for meetings. Participants could pick and choose between concurrent sessions put on by different societies, e.g. all of the sessions on phylogenetic reconstruction if that is what interests you. The disadvantage is that members who wanted to avoid certain topics could more easily do so, e.g. cladistics again! And, it may be difficult to get a good audience for students to present their work to, especially if their topic is off the main theme. Another disadvantage is that the society loses flexibility in setting the time and place of its meetings, although we could continue to run our own smaller workshops independently. Moreover, we are obliged to meet annually under our new constitution. The idea may run into problems with societies having differing interests, e.g. systematics versus ecology. Perhaps the meetings should be restricted more narrowly to systematic societies. This could make the Australian Biodiversity Council an appropriate umbrella group.

If our members are favourable, I would approach representatives of the relevant societies and try to get some feel for how interested they might be. This

is a long-term proposal, since it would take a few years to get meetings into synchronization. We are already committed to meetings up to 1998!

### Kuranda symposium

The symposium on monsoon tropical flora was a resounding success, due in no small measure to the organisational ability and sheer hard work by John Clarkson and his colleagues. John's aim was to prove that far north Queenslanders can put on as good a show as the rest of us, but I think they did even better than that. The scientific program was excellent (see the review by Pieter Baas), and the post-symposium field trip organised by John Neldner was outstanding (see the report by David Morrison).

Good news from John Clarkson is that the Kuranda symposium has made a nice profit of about \$8,000, after paying all of the bills. This certainly relieves the recent financial pressure on the Society. Creditably, John raised more than \$4,000 in cash and kind from a variety of sponsors. Council has decided that \$3,000 should be paid into the Society's current account to repay an advance we gave to the symposium, plus the travel costs associated with the Council meeting. We will deposit the remaining \$5,000 in the Hansjörg Eichler Research Fund (see below).

Some people may argue that the symposium should not have made a profit, but that instead the registration fee should have been lower to make it easier for members to attend, especially students. So, I would like to point out that (i) the registration fee (\$100) was not high for a meeting of that length and quality, (ii) John raised more than \$4,000 in sponsorships, which is nearly the full amount of the nett "profit", and (iii) there was a huge saving in the unpaid (by registrants) labour of John and his colleagues, such as John Neldner and Rebel Elick. Many conference organisers pay high fees to professional consultants to do the organisational work that John and colleagues did at no cost to the Society. Of course, we are indebted to the employers of John and his colleagues (BRI and QRS) for allowing them to organise the meeting as part of their paid duties. To assist students, we charged them a concessional registration fee (\$75),

and those who gave papers had all or most of that fee waived. However, having said all that, I think that if a conference only breaks even, or is unable to return an advance from ASBS, that is okay. The purpose of the society is to enable communication among members, by means of conferences and the *Newsletter*, and if that costs us money then so be it.

### **Hansjörg Eichler Research Fund**

Council has decided to name our research fund in memory of our esteemed, but sadly departed, colleague. Hansjörg was dedicated to assisting students, and this is the purpose of the research fund. We had previously decided that we would begin to use the fund after the balance exceeded \$10,000, and that milestone is very close with the addition of the profit from the Kuranda symposium. I urge members to send donations, however modest.

### **Finances**

The Treasurer's report (included elsewhere in this *Newsletter*) indicates that ASBS has made a loss over the last couple of years. While this is a matter of some concern, there is no need for panic. The losses have not been huge, and we still have adequate reserves. The difficulty has been caused partly by the drop in interest rates — we used to earn thousands of dollars per year from our investments,

but now we only earn hundreds. However, it is clear that we need to increase our annual subscriptions, and the General Meeting agreed to an increase of \$5 for regular members. Students will pay no more. As I have stated above, I believe that the society exists primarily for communication, and in fact our major expenses have been the symposia and the *Newsletter*. Both of these have increased in quantity in the last couple of years, so we have obtained good value for our money. In any case, the trend has already reversed this year, due to the profit from Kuranda and the withdrawal from FASTS.

### **Membership Officer**

To relieve the pressure on the Treasurer, who has a heavy workload, Council has separated the duty of managing the membership from that of financial management. The former task will be taken over by Andrew Lyne, our Public Officer, who in any case is required by law to keep an up-to-date membership list. From the beginning of 1995, prospective members should apply to Andrew, not to the Treasurer. Meanwhile, we will redesign our membership application form to make it more friendly. (The requirement for nomination by two members is forced on us by law, but we can present this in a less off-putting way.)

Mike Crisp  
President, ASBS Inc.

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## **NEW EDITORS**

In the March issue it was announced that Nick Lander was taking over as the new editor. For personal reasons Nick has declined taking up the position. This issue has been edited by David Morrison with page layout, printing and mailing undertaken from Darwin. As from the December issue, staff at the Northern Territory Herbarium, Darwin will be editors. Items can be directed to either Clyde Dunlop, Greg Leach or Ian Cowie. The only immediate change in editorial policy is that lengthy articles must be submitted in electronic form.

## ARTICLES

### **A range extension for *Alphitonia incana* (Roxb.)Kurz (Rhamnaceae)**

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#### **Introduction**

*Alphitonia incana* (Roxb.)Kurz is a tree up to 25 metres high, which grows in rainforest clearings or margins, or disturbed rainforest in frost-free regions, where the rainfall exceeds about 1,500 mm per year. *A. incana* has a characteristic pagoda-type branching pattern, where the branches and leaves are held horizontally, in successive layers. In this regard, it is similar to *A. petriei* Braid, and these species can be difficult to distinguish from a distance. However, on closer inspection, *A. petriei* is readily distinguished by (for example) its smaller stipules, cuneate leaf bases, and smaller seeds.

#### **Distribution**

*A. incana* is a widespread species in the islands to the north of Australia, having been recorded from Vietnam, Sumatra, the Philippines, Sulawesi (Celebes), the Moluccas, Timor, Borneo, New Guinea, and the Solomon Islands.

It was first recorded for Australia (as *A. moluccana* Teijs. & Binn. ex Braid) by Braid (1925), who cited a specimen collected at Cairns by C.T. White. Hoogland (1960) placed *A. moluccana* in synonymy with *A. incana*, but did not comment on the Australian distribution of the species. The name *A. incana* has been only sporadically applied in Australia; for example, Hnatiuk (1990) records

it only for Queensland, in the Cook and Wide Bay districts. The record from the Wide Bay district is erroneous, and originates from a mis-coded New Guinea specimen held at BRI. Herbarium specimens of *A. incana* held at BRI indicate a sporadic distribution in Australia; that is, a few isolated parts of the Kimberley in Western Australia, around Darwin in the Northern Territory, and in northern Queensland. Wightman & Andrews (1989) describe and illustrate "*Alphitonia excelsa*" from the monsoon vine thickets near Darwin; with the exception of the distribution given, and the whole-tree illustration, the taxon described and illustrated is clearly *A. incana*.

***A. incana* is a  
widespread species in  
the islands to the north  
of Australia**

The name *A. philippinensis* Braid has been misapplied (e.g. Hyland 1982, Hyland & Whiffin 1993) to populations of *A. incana* from the "wet tropics" of north-eastern Queensland. The Queensland distribution of *A. incana* centres on coastal areas of high rainfall between Cooktown and Ingham, where the species is quite common, but it also grows on Cape York Peninsula, e.g. Bamaga, Iron Range, Mellwraith Range. Until recently, the only recorded occurrence south of Ingham was from "0.5 km north of Conway Beach, c. 30 km E of Proserpine" (specimen collected by Philip Sharpe in 1985).

#### ***Alphitonia incana* in southern Queensland**

In February 1993, I found a single tree of *A. incana* growing in disturbed rainforest at the base of Dunethin Rock, east of Yandina (c. 100 km north of Brisbane). This locality is 800 km south of the Conway Beach site, which is itself a disjunct occurrence south of the main population between Ingham and Cooktown. Hence, this appeared to be a remarkable disjunction. However, since there was only one tree at Dunethin Rock, there was the

possibility, albeit unlikely, that the tree may have been cultivated. Subsequent searches in nearby areas of similar habitat confirmed that the species is indeed indigenous to this area of southern Queensland.

To date, I have located eight populations, ranging in size from one tree to about twenty trees. They are all (except for one tree) confined to an area 15 km x 20 km, bounded by the Blackall Range in the west, Eumundi in the north, Nambour in the south, and Coolumb in the east. The exception is a single tree growing beside Mons Road, Buderim, about 15 km further south. These southern Queensland populations are invariably located at altitudes of less than 100 m, and grow in disturbed rainforest or in semi-rainforest over-topped by *Eucalyptus grandis* or more rarely by *Melaleuca quinquenervia*. The soils are sandy loams to clay loams, and are moderately fertile. The rainfall there averages 2,000 mm per annum.

### Conservation status in southern Queensland

Because *A. incana* grows in a high rainfall area at low latitudes on fairly flat ground and on reasonably fertile soil, much of its habitat has already been cleared for sugar cane production or grazing purposes. Remnant populations face the new threat of urban development, as this region has one of the fastest population growth rates in Queensland.

While the species as a whole is not rare or threatened, the southern Queensland populations are very much endangered, with the real possibility of extinction in the near future. Sadly, little or no attention is given by conservation authorities and legislators to disjunct occurrences such as this, even though disjuncts are just as valuable in terms of regional biodiversity as endemic species.

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### Materials towards an early history of *Oxalis corniculata* L.

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### Introduction

The satisfying typification of *Oxalis corniculata* L. by Watson (1989) has paved the way for a new

approach to the taxonomy of the section *Corniculatae*. I believe that *O. corniculata* L. *sensu stricto* embraces not only the type variety but also var. *atropurpurea* Planchon and var. *villosa* (Bieb.) Hohen., thus corresponding essentially to *O. corniculata* ssp. *corniculata* as circumscribed by Lourteig (1979). Further examination of *O. repens* Thunb. is required before we can be confident that it belongs here.

But where does *O. corniculata* L. come from? Watson (1989) implies that it is a relatively new introduction to Europe, but does not suggest from

where. Lourteig (1979) believes that it probably originated in Mediterranean Europe, and mentions that it has been recognised from time immemorial and is referred to in the oldest classical works which, unfortunately, she does not enumerate. Eiten (1963), whose concept of *O. corniculata* L. is much too broad, considers the complex to be of Old World origin. The new floras of South Australia and New South Wales both record it as probably a native of Europe. Other floras that I have consulted treat it most frequently as cosmopolitan or a cosmopolitan weed, or refer to its being widely distributed in the tropics, warmer parts of the world or in the temperate and warm regions. In Australia it has been sometimes considered native or at least part of a complex with some native representatives. In Japan it is not considered to be an introduced species.

In this short note, I wish to draw attention to some early Eurasian references, written before Columbus' discovery of America in 1492, suggesting at least that we do not need to invoke American origin even though other members of the section *Corniculatae* have originated there. To discover whether it occurred or is likely to have occurred in America in pre-Columbian times requires a separate detailed study.

### Early European References

Chauvel (1903), whose interesting thesis was later much used by the monographer Knuth (1930), cited a reference to *Oxalis*, which I believe must be *O. corniculata* L., in a 1508 edition of *Opus Pandectarum Medicinæ* by Matthæus Sylvaticus. According to Sarton (1931), Sylvaticus, lexicographer, botanist and physician, was born in the latter part of the 13th century, flourished at Salerno, south of Naples, where he kept a botanical garden and taught in the medical school. His large work on *materia medica* called *Opus (or Liber) Pandectarum Medicinæ* is believed to have been completed by 1317, and earned him the nickname "Pandectarius", under which name alone he appears in Arber (1953). His work is a curious compendium or pandect, a conglomeration of knowledge acquired from many sources — contemporary, Greek, Roman, Arabic. The first printed edition of this work (the *editio princeps*) appeared in 1474, followed by many

others, some of which are available on microfilm. The work presents enormous difficulties in translation. Here is the beginning of the entry which I believe at least partly refers to *Oxalis corniculata*, from the 1480 edition of *Liber Pandectarum Medicinæ* printed in Vicenza.

### Cap. lxxvi

*Bachaelh grece latine luyula vel panis cuculi. Luyula est herba acetosi saporis. Folium eius est parvum et tripliciter divisum; et in cacumine cuiuslibet partis est alia incisura. Semina eius sunt in vaginulis similibus corniculis que cum tanguntur tempore maturationis evolant ab eis.*

"Bachaelh" is Sylvaticus' transcription of the Arabic name. The description of the flight of the seeds on touching the mature capsules is probably based on Sylvaticus' own observations. I have been unable to find any earlier references to the name "Bachaelh". It has been copied in later works, for example in *Gart der Gesundheit* (1485 — see Arber 1953) and in *De Stirpium Historia* (Tragus 1552) as Bachael. Chauvel (1903) spelt it "Bachaelb".

The common names "luyula" and "panis cuculi" are usually applied in Europe to *Oxalis acetosella*. "Luyula" was early corrupted or modified to "alleluia" by many European writers. Tournefort (1700) in his *Institutiones Rei Herbariæ* gave his *Oxys lutea* ... *Oxys sive Trifolium acetosum flore lutea* ... *Trifolium acetosum corniculatum* ... (= *Oxalis corniculata* L.), the common name, "alleluia à fleur jaune", which encourages me to think that the early writers could have used the word "luyula" or its equivalent to embrace the two species *O. acetosella* and *O. corniculata* or to signify either one of them.

Another early description in the English *The grete herball*, 1529 edition, concerning *Oxalis* is quoted by Arber (1953):

*This herbe groweth in thre places antl specyally in hedges, woodes and under wallessydes and hath leves lyke iii. leved grasse and hath a soure smell as sorell, and hath a yelow flowre.*

Arber commented that this could not be applied to the British *Oxalis acetosella*, with its delicate white flowers veined in pink, and that it surely indicated that *The grete herball* was of continental origin. Indeed, Sarton (1931) traces it back to *Liber de simplici medicina secundum Platearium dictus Circa instans* of Matthaeus Platearius, a Salernitan physician who died in 1161. What could "this herbe" be but *Oxalis corniculata* L.!

Earlier references to *Oxalis sensu* Linnaeus by classical writers are hard to find. The most often quoted is Pliny (1st century), where, in Book 27 of his *Natural History*, he gives the very brief descriptive note: "Oxys folia terna habit" (*Oxys* has three leaves). Dodonaeus (1583) in *Stirpium Historiae Pemptades Sex* ascribed this to the plant we now know as *Oxalis acetosella*, presumably because it was the plant best known to him and other botanists of his time. There must, I think, be classical references to *Trifolium acetosum* or *Trifolium acidum* or perhaps to *Oxytriphylon*, the name used by Tragus (1552), but so far I have been unable to find them.

### Early Chinese and Japanese References

Bretschneider (1881) wrote that *Oxalis corniculata* L. was referred to in two of the most celebrated Chinese works on *materia medica*. These are Li Shih-Chen's *Pên Tshao Kang Mu* (traditionally translated as *The Great Pharmacopoeia*), which appeared in the last decade of the 16th century and the *Chiu Huang Pên Tshao* (*Treatise on Wild Food Plants for use in Emergencies*) which appeared first in 1406 (Needham 1986). In the former work, Li Shih-Chen refers to the use of the preferred name for what Bretschneider believed to be *O. corniculata* in a much earlier work. This work, the *Hsin Hsui Pên Tshao* (*New [literally Newly Improved] Pharmacopoeia*) which appeared in the latter part of the 7th century, was the first national pharmacopoeia issued by royal decree in any civilization (Needham 1986).

The Chinese name for *O. corniculata*, used first so long ago, is indeed the proper name for it in current Chinese botanical literature.

Li Shih-Chen in *Pên Tshao Kang Mu* gives a number of other popular names, one of which he attributed to a work of the third century, no longer extant except in quotations, namely *Li Shi Yao Lu* (*Mr Li's Record of Drugs*) by Li Tang-Chih, written in 225 (Needham 1986). Li Shih-Chen recorded what little descriptive botanical information was available to him from the sources already mentioned and from another work no longer extant except in quotations, *Pên Tshao Thu Ching* (*Illustrated Pharmacopoeia*; or *Illustrated Treatise of Pharmaceutical Natural History*) written by Su Sung *et al.*, which appeared in 1061 (Needham 1986). He also provided some additional material of his own.

In summary, he referred to its occurrence on roadsides and in moist places near human habitation and in gardens; its dense growth up to 50 mm high; three leaves (leaflets) borne at the end of stalks, each leaf (leaflet) divided at the apex; yellow flowers giving rise to capsules up to 5 mm long with small dark seeds. He, himself, recorded the precise sleep movements of the leaflets.

Two Japanese works were the direct result of the *Hsin Hsui Pên Tshao*, namely the pharmaceutical natural history *Yakkei Taiso* by Wake Hiroyo, appearing about 790, no longer completely available, and *Honzo Wanyo* (*Synonymic Materia Medica with Japanese Equivalents*) by Fukane Sukehito, finished in 918 (Needham 1986). The materials in both were arranged according to the *Hsin Hsui Pên Tshao*. The latter includes additional Japanese materials, and is essentially a catalogue of Chinese names, often with the Japanese name written for the first time in phonetic Chinese characters.

*O. corniculata* appears under its proper Chinese name, with two other Chinese names and the Japanese name "katabami", the accepted Japanese botanical name in use today. Long part of the Japanese consciousness, "katabami" has been featured in family insignia and in the little poems called *haiku* like this one by Basho's disciple, Kakei, who died in 1716:

*Kura no kage katabami no hana mezurashi ya*

In the shade of the barn

Oxalis flowers

How sweet they are!

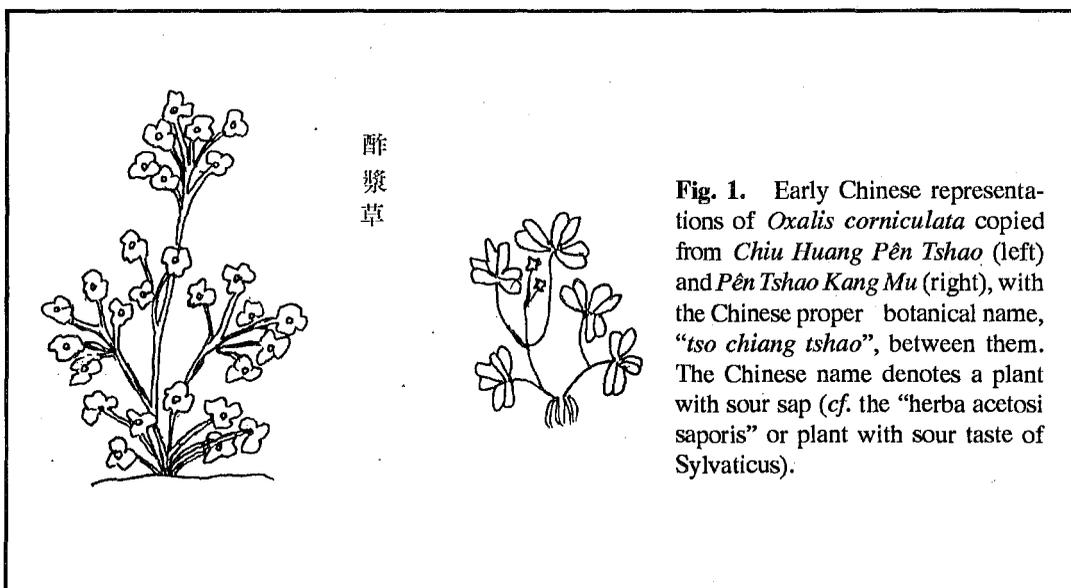
[my translation]

It is clear, then, that *O. corniculata* was known in the East very early, but was it brought in from the South or the West earlier still? And how much of the valuable material in China and Japan now known as *O. corniculata* really fits *O. corniculata* L. *sensu stricto*?

I intend to examine these works for additional material which may be helpful in answering the question of origin.

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**Fig. 1.** Early Chinese representations of *Oxalis corniculata* copied from *Chiu Huang Pên Tshao* (left) and *Pên Tshao Kang Mu* (right), with the Chinese proper botanical name, “*tso Chiang tshao*”, between them. The Chinese name denotes a plant with sour sap (cf. the “herba acetosi saporis” or plant with sour taste of *Sylvaticus*).

## COMMENTARY

### The origin of the name "Australian Systematic Botany Society"

I have heard many versions of who proposed the name of the Australian Systematic Botany Society, but one of the first uses of the name appears to have been by Dr Selwyn Everist (then Director of the Queensland Herbarium). While preparing the archives of the Society for storage at the National Herbarium of Victoria (MEL), I noted in a letter from John Parham (BRI) to Dr Nancy Burbidge, that Selwyn was given the credit for this name.

"He [Selwyn] feels that a more suitable name for the proposed Society would be 'Australian Systematic Botany Society'" (Parham, correspondence, 6 July 1971). The next recorded mention of this title appears to be in the "Comments on draft of rules" [for the Society] from a meeting in Adelaide (Hansjörg Eichler, correspondence, 9 March 1973).

Barry Conn  
National Herbarium of New South Wales

### Holotype of *Lepidium hypenantion* Hewson

Mr Keith Ingram has advised me of more details of the type of *Lepidium hypenantion* Hewson, *Brunonia* 4(2): 297 (1981). Keith collected the type on the 15th September, 1955. This collection has the accession number 7968 in his private herbarium. Subsequently, a duplicate of Keith's collection was sent to NSW. This specimen was incorporated into the NSW collection (with incomplete label data), and was subsequently designated as the holotype of

*L. hypenantion*. Consequently the typification data published in *Brunonia* and the *Flora of Australia* is incomplete (even misleading).

The correct collecting details for the holotype of *Lepidium hypenantion* should be as follows:

Ungarie School (Central Western Slopes of NSW), C.K. Ingram 7968, 15 Sep. 1955.

Helen Hewson  
Flora Section  
Australian Biological Resources Study

## NOTICES

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## KURANDA



**ASBS Symposium**  
**“Origin and Evolution**  
**of the Flora of the**  
**Monsoon Tropics”**

Kuranda Rainforest Resort,  
 Kuranda, Queensland 4-6 July 1994

### Summary address

Pieter Baas  
 Rijksherbarium/Hortus Botanicus  
 Leiden

From the first key-note speaker of this symposium, John Luly, we learned that the unifying element of the northern part of Australia is its monsoonal climate: the alternation of wet and dry seasons. Rainfall data for Kuranda, provided with the symposium documentation, dramatically illustrated the point that this also applies to those eastern parts of Queensland which we reckon to belong to the wet tropics: over 80% of its total precipitation falls between December and May, and in July only just over 2% of the annual rainfall sustains its lush vegetation.

Exceptions confirm the rule, and the monsoonal climate of north-east Queensland is no exception to that age-old maxim. From 4—6 July 1994 the copious rainfall in Kuranda induced John Clarkson, the indefatigable chairman of the organising committee, to start all morning announcements with an apology for the weather. Would the plants have minded such deviations from the norm? I could not help wondering, when for three days the main theme of the programme was the origin and evolution of the flora of the Australian monsoon tropics. For the

hundred plus participants of the symposium it certainly did not, because the Kuranda Rainforest Resort, with its newly built conference facilities, was such an ideal venue for scientific and social exchange that a downpour or two was of no significance.

Three widely divergent lines of evidence were pursued to get some grip on the elusive theme of the conference: the fossil record and geological history, floristic comparisons, and the (historical/cladistic) biogeography of individual clades. As it turned out, all three approaches had much to contribute, although at present more data are needed before an entirely satisfactory scenario for the origin and evolution of the monsoon flora in Australia can be written.

The importance of plate tectonic events since the Cretaceous, and of more recent Pleistocene and Quaternary glaciations, in accounting for the complex floristic affinities of northern and eastern Australia with Malesia was stressed in several presentations, but hardly any new data were presented. The same applies to evidence from the fossil pollen record, except for a number of intriguing pollen diagrams described as “boring” by John Luly. Fossil leaf assemblages from the Eocene of central Australia were subjected to a rigorous analysis in a paper by David Greenwood, and their overall physiognomy was interpreted as an indication of “monsoon forest” plant communities. This would be well before the timetable adhered to by some delegates, allowing for the arrival of a truly monsoon climate not before the Pleistocene.

Might the early seasonality of the Australian plate at its high palaeolatitudes have predisposed part of its flora for the later monsoonal seasonality? What difference did or does it make for a tropical flora to become subjected to a truly monsoonal regime influenced by trade winds and the vicinity of oceans, or to seasonality of another kind? Why are the Neotropical dry floras of eastern Brazil never called monsoonal despite their seasonality of rainfall? These questions were milling through my

uninformed mind during the first morning session, which also included interesting contributions by Mike Pole and David Bowman on a late Tertiary leaf flora on Melville Island from a presumably open seasonal forest of subtropical rather than tropical appearance, and by Mike Hopkins and Andrew Graham on extensive rainforest contractions and expansions in north-eastern Australia over the last 30,000 years as deduced from charcoal analysis.

Dinah Hansman's talk on the origin and evolution of vine thickets had to compete with the noisy air-conditioning (chairpersons of later sessions were fortunately instructed about how to switch it off). Her review of literature data and personal observations painted a picture of taxa sneaking in and out of Australia for many millions of years, with old Gondwanic and more recent Laurasian/Malesian land contacts allowing for migration. Gabriella Crowley's account on the changing extent of mangrove formations due to the subtle balance of sea level changes and sedimentation of fluvial deposits ended with the hopeful prospect that future climatic change was bound to increase the surface area of Australian mangrove formations once more, provided that human interference do not wipe them from the earth in the present interglacial.

Floristic comparisons would potentially have been able to shed some light on the proportion of Gondwanic and Laurasian/Malesian or other intrusive elements in the flora of monsoonal Australia. Cladists would, and did, challenge such evidence as anecdotal and discard it as the futile result of producing yet more floristic/faunistic balance sheets. Nevertheless, I believe that such balance sheets, conducted and interpreted by sophisticated botanists such as Burbidge, van Steenis and Barlow have produced the excellent working hypotheses which cladistic biogeographers and palaeobotanists can now test. At this symposium, there were only a few such floristic contributions. Jeremy Russel Smith and co-authors, recently having produced the detailed atlas of flowering plants in the Northern Territory, could speak with some authority when they pointed to the high degree of floristic affinity at the species level (!) between the Australian monsoonal flora and eastern Malesia (57%), western Malesia (44%), Wallacea (43%), south-east Asia (38%) and India (32%). The

question as to which part of these species has achieved their present day distribution by emigration or immigration had to remain unanswered.

In contrast to the apparently dominant, widespread element there are rainforest taxa in small isolated pockets, which Ian Cowie and Clyde Dunlop explained to be old Gondwanic rainforest relics. The more xeric Gondwanic elements show a high level of endemism in the Northern Territory, and apparently speciated *in situ*. Analyses of the aquatic flora of various parts of Australia by Karen Wilson and Surrey Jacobs showed a close similarity between monsoonal Australia and New Guinea on the one hand, and of south-western Australia with Tasmania and New Zealand on the other. Long-distance dispersal was invoked as an explanation. David Bowman showed some interesting and largely counter-intuitive changes in botanical diversity along a latitudinal transect of 15 degrees — the number of species increased with increasing latitude and drought.

Systematic papers that specifically addressed the problem of the origin of the monsoonal taxa could be divided into classical and area-cladistic ones. Both had interesting results to offer. John Dowe made it plausible that most palm clades in Australia are autochthonous, and that only a minority are relatively recent migrants from west Malesia. Wayne Harris and Bill Laverack had another story to tell for the Orchidaceae — most are probably recent arrivals from the north west — only the Australian terrestrial orchids of the Diurideae are of Gondwanic origin. On the basis of a comprehensive cladistic analysis, Ken Hill could elegantly demonstrate that all Australian *Cycas* species evolved after a single intrusion following the late Miocene collision of the Australian plate with the Sunda plate.

The most in depth area-cladistic paper was by Mike Crisp and co-authors, who had rigorously massaged a dataset consisting of 11 phylogenies of Australian endemic genera to find that there are two distinct patterns among tropical taxa, one showing a close relationship among the monsoon tropical areas, including New Guinea, and the other as a track of successive differentiation along the east and south coasts, central Australia and the south-west.

Interestingly, the Australian wet tropics, although geographically proximate to the monsoon tropics, are clearly part of this east-coast track. Hubert Turner's paper on 7 Sapindaceae genera occurring both in Malesia and Australia, and Marco Duretto's talk on the cladistics of section *Valvatae* of the genus *Boronia*, constituted very nice complements to the Crisp *et al.* paper, and confirmed the long-separate histories of the dry and wet tropical flora's of northern and eastern Australia. Ken Hill's bloodwoods showed a more complex distribution history, partly confounded by widespread taxa, which make any cladistic biogeographical analysis difficult.

With that conclusion I can only strongly support the need for more cladistic biogeographical analyses based on a wide variety of taxa occurring both in Australia and Malesia (Australian colleagues, join that Flora Malesiana Project!). However, we do need the floristic balance sheets as well as, and integrated with an incomplete fossil record (from both pollen sequences and macrofossils) to extend our understanding of the origin of local floras beyond that of their endemics resulting from vicariant speciation.

Thus, the theme on the origin of the tropical monsoon flora was well-served by very interesting contributions. I would have liked to hear a bit more about its evolution in terms of specific adaptations to the monsoonal conditions. However, only Judy Egan's paper on changes in deciduousness and incidence of storage roots along a latitudinal transect from Darwin to Alice Springs was in that category. As a wood-anatomical outsider, I would also have appreciated an additional review paper with a state-of-the-art update on floristic affinities and land contacts throughout time of the monsoon tropics with other flora's — a sort of update on Brian Barlow's introductory synthesis in the *Flora of Australia Volume 1* published in 1981. Of course, there also should have been a wood-anatomical contribution, especially using data from fossils and tree rings to give the programme a truly scientific base!

I would do total injustice to this successful symposium if I did not mention the numerous excellent contributions that were outside the direct

scope of the monsoonal theme:- George Scott's erudite Nancy Burbidge Memorial Lecture printed elsewhere in this *Newsletter*; the many bryological papers of great interest, which served as an upbeat for the subsequent workshop of not less than 31 over-zealous bryologists from Australia, New Zealand, Singapore, and the USA/Philippines; the mini-symposium on the systematics and biogeography of Lauraceae; some excellent papers on the molecular systematics of polyphyletic families or *incertae sedis* genera; and last but not least the eloquent and fully justified plea for more mycology in Australia by Kevin Hyde, presently from Hong Kong.

The pre- and post-symposium excursions served as dramatic illustrations of the differences between the wet and dry floras of tropical Australia. The vine thickets of Chillagoe and the diverse dry woodlands between Mareeba and Cooktown showed such a stark contrast in weather conditions and vegetation that our scientific reflections on their different histories seemed almost trivial. *Homo sapiens* clearly belongs to the monsoonal element in northern Australia, because our eastern track in the wet tropics was effectively blocked by heavy rainfall. Yet our short-lived status as invasive elements in the mangroves of Cooktown, and the user-friendly rainforest reservations of Mossman Gorge and Daintree provided the exotic flavour that made the Kuranda venue so attractive for an ASBS gathering. John Neldner's and Bruce Gray's species knowledge of both the dry and wet floras was extremely impressive, and provided welcome guidance.

What impressed me most of all at this meeting was the overwhelming friendliness of Australian botanists. All my attempts to insult large sections of the audience during my after-dinner speech hopelessly failed. Even the cladists of international repute were not perturbed by my "foaming round the mouth" analogy, and Peter Weston even had the courtesy to show me how to do it at breakfast. So, I give up, and abuse my privilege as reporter of this symposium to thank you all very much, especially John Clarkson and his organising Committee, for inviting the Dutch to this 20th anniversary ASBS Symposium and letting them have such an enjoyable and educational experience.

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## The Nancy Burbidge Memorial Lecture

### Cryptogams: the better investment

George A.M. Scott  
Botany School  
University of Melbourne

#### Introduction

When I came to Australia 25 years ago, Nancy Burbidge asked me to join a committee she was setting up to press for a new *Flora of Australia*. Eventually, as you know, this committee and its successors led to the establishment of the Australian Biological Resources Study and the initiation of the present *Flora*. Nancy wanted me there so that the cryptogams would not be forgotten in the push — a remarkably long-sighted view for an exclusively angiosperm taxonomist, and demonstrating a unified view of botany that is admirable but now much less common. My job today is to do as she asked, to fly the flag for cryptogams and flap it in your faces a few times, and to plead for that traditional unitedness of botany. I hope that in the process you will remember her kindly, as I do, and admire her vision.

#### Importance

Can you imagine a world without seed plants, with only cryptogams — the algae, fungi, bryophytes and pteridophytes? Suppose some virulent analogue of *Phytophthora cinnamomi* wiped out all the Spermatophyta but left other plants unharmed. Where would we be? It might sound like Paradise to some in this audience, but of course most of us would be dead. A few might survive eating fern rhizomes like the Maoris used to, and eating the few terrestrial animals that could survive without Angiosperms to browse on; supplemented perhaps by the sporocarps of *Marsilea* like Burke and Wills at Cooper Creek. They died, of course, possibly as a result of doing so, but then they didn't know how to prepare them, and we would. Wouldn't we? The rest of the survivors would have retreated to the seas and lakes and rivers to eat fish and shellfish, like our prehistoric forebears and the aboriginal inhabitants of this land. Life, in fact, would go on — for some.

The role of cryptogams in the world's ecology is

usually under-estimated. The truth is that the world could survive in a reasonable, Carboniferous sort of way without phanerogams, but without cryptogams the world and its ecosystems would probably collapse. Virtually all of the primary productivity of all fresh and salt waters is phytoplanktonic — the contribution of marine and freshwater vascular plants must be insignificant on a global scale. Not only that, but aquatic productivity probably represents about half of the world's total primary production. I say "probably" because the estimates vary widely, but as the rainforest continues to be logged, the significance of marine plankton productivity continues to rise. Although I wouldn't suggest that half of the world's botanists should therefore be studying phytoplankton, and although one could argue that these algae will continue photosynthesizing as they always have done without our assistance or knowledge, it might seem that the imbalance in attention is surprising and perhaps imprudent, and that it would be better for the world to invest more in the study of algae, on which our survival depends.

If the algae are responsible for about half of the world's productivity, the fungi, as mycorrhizas, are vital to the achievement of much of the rest. Quite how widespread vesicular-arbuscular mycorrhizas are is not known, but they seem to be not far short of ubiquitous, with frequencies of 50-90% estimated. I know of no estimates of how the world's vegetation would fare if mycorrhizas disappeared, but probably very poorly indeed. It is not impossible that we'll discover the answer in Europe, where acid rain seems to be destroying the fungus flora. Mycorrhizas represent the importance of fungi on the production side, but on the decomposition side fungi may be even more important. Without them, the earth's surface would probably be miles deep in plant litter. Bacteria do their best, but it is the fungi that are mainly responsible for removing wood and recycling the carbon and nutrients. Even with wood-rotting fungi present in a stand of red-beech (*Nothofagus fusca*) forest in the Eglinton Valley in South Island, New Zealand, I once estimated that it took about 500 years for a very big fallen tree to disappear completely, and the forest floor was littered with a criss-cross meshwork of fallen trunks. Without fungi, heaven knows how long the process would have taken.

Quite apart from the carbon cycle, of course, the fungi are the major pathogens of plants, both native and cultivated — and for that matter quite significant pathogens of *Homo sapiens*, even if clearly far less important than bacteria and viruses. But while the pathogenic fungi are of immense significance for mankind, their fundamental importance to the biosphere is less than that of the decomposers. Yet the number of fungal specialists, in basic research rather than just pathologists, is decreasing alarmingly; and indeed it is close to the crisis-point of no-return in Australia, where an immediate increase in trainees is required while there are still a few people left in Australia to train them. It would be a very good investment.

The bryophytes and lichens (if you will concede that the latter can be treated apart from the fungi) are clearly subordinate to algae and fungi in the significance of their roles on the world scene, but they are not unimportant, at least in temperate regions. They have major roles in forest, both in maintaining humidity levels in wet forest, and in filtering the throughfall and in exchanging cations; in drier country, such as the Australian mallee and the tundra, they play perhaps the most important role in maintaining a stable soil; and on rocks they are the primary, indeed usually the only, colonizers, which gives them a leading role in the ecology of our mountain regions. Once again, the amount of research into these groups in Australia (that is, fundamentally, the number of employment positions available) is far less than their importance requires.

For pteridophytes, the position is somewhat different. Being vascular plants, although cryptogams, they are usually included with the seed plants, both in vegetation/floristic work and in the repertoire of herbarium and field botanists. Their ecological role is very limited, although their intrinsic interest is very great, and there is little evidence that they are not receiving their fair share of attention.

Why, then, when cryptogamic botany is so important, has the study and teaching of it declined so much in recent decades in Australia?

### Education

It is not necessary for me to reiterate to this audience the concerns that we all have about the decline

of taxonomy throughout the world, and the potentially disastrous undermining of the whole of botanical science that this presages. The process has been, I think, a feedback loop, starting with the universities, where pressure to incorporate new disciplines has led, inevitably, to the elimination of the old. It is a natural consequence of the information explosion, and it makes university teaching very much like a common type of cryptogam growth found, for example, in thallose liverworts, where the apex keeps on growing but the rear dies at the same rate so that the plant never increases in length. Incidentally, there appears to be no name for this kind of growth, and this is one case where a new word would be useful, but I haven't yet had the wit to think of a euphonious one. Fewer trained products from the universities leads to fewer staff, and so the vicious cycle loops on.

Well, just as botany has suffered by the decay of taxonomy, so it has suffered by the decay of cryptogamic botany. When I started botany in Glasgow 40 years ago, the aim of that first-class teaching department was quite explicit: that you should, if given any piece of plant material from anywhere in the world, be able to investigate its structure and morphology intelligently, and be able to identify it to a level where you could locate the relevant literature (or expert) to identify it further. The only group where this noble principle was not properly carried through was the flowering plants, where we had an inadequate grounding in the taxonomy of extra-European families; and possibly also the Pteridophytes, where Professor John Walton, a most distinguished but absent-minded palaeobotanist, in a year-long pteridophyte honours course completely forgot to deal with the *living* ferns.

But I have lived to be grateful for this training. On coming to New Zealand and Australia, apart from the roadside weeds, most of which are the familiar European flora of my youth, the angiosperm flora — even at family level — was (and is) an abominable mystery. It is true that, given good flowers and fruit, I can usually key out individual species, but the angiosperm flora is as much *terra incognita* to me as the land was to Captain Cook. The cryptogams, however, are much more accessible. Algae, fungi, and bryophytes and even, to a lesser extent, pteridophytes, being older groups than

angiosperms have more widespread distributions, and with a sound training in cryptogamic botany you can feel at home (botanically speaking) in almost any part of the world, if you stay away from angiosperms. It is true that the species may be and will be different, but a good many genera (apart from the oddities) are worldwide, or were at least until the modern passion for generic dismemberment took hold. The time spent in getting a good grounding in cryptogams is therefore time well spent — a better investment of training (at undergraduate level) than with the angiosperms, where a thorough knowledge of the Australian native flora, for example, is almost valueless in Europe or America, or vice-versa.

The balance seems to me to have been moving steadily away from cryptogams towards phanerogams over the last few decades, as part of a general disruption of the formerly united science of botany; and the new discipline of cell biology, which should have brought unity, has actually been the most destructive influence on the science of pure botany in my lifetime.

Perhaps the most potent force underlying this change has been the shift away from internal to external funding for research, both in universities and in government establishments. This has meant that the traditional practice of impartial support for all worthwhile research and researchers has been replaced by increasingly biased support for the popular, the trendy and the financially profitable. This arises no doubt from subservience to the so-called market forces, which take no account of long-term importance but have now become a pervasive and convenient dogma for the opportunists in our society, especially those arch-opportunists our politicians. The botanical community, like many other basically academic disciplines, has thereby been divided into the haves and the have-nots.

### **Words**

Although you may find it surprising, I believe that one of the other main causes of the drift away from cryptogamic botany lies in the misunderstanding of words — what they mean and how they work.

For the last 50 years or so I have been fascinated, even bewitched, by words, and how they work. How,

even in these days of universal television, it is words — not images — that control how we act and direct how we think. Even in science, or at least the biological sciences where words are still used and have not been replaced by more esoteric symbols, they have an enormous influence, and many of our current problems with botany are at least prompted or exacerbated by misunderstanding of how words work. There is a prevalent error which has greatly affected and continues to affect the science of botany — the quite erroneous belief that words work primarily through their meaning, their definition if you like.

The properties of words, by which they act, can be reduced to three (I can think of no more): sound, content (or meaning), and associations. Sound we can ignore in the present context — its effects are largely confined to poetry and declamatory prose, and to analyze the persuasive effects of the sound of a lecturer's words, for example, would be seen as panning for fool's gold. Meaning, I will try to show, is sometimes of subordinate importance. But associations — the overtones which a word can trigger off — are a different matter; their influence can be enormous. I can't refrain from sharing with you a quotation that came my way two or three days ago. It is Churchill describing Hitler's rise to power: "Into the void strode a maniac of ferocious genius, the expression of the most virulent hatred that has ever corroded the human breast". The power of that passage lies almost wholly in the associations of the words, the images they conjure up. The meanings are altogether secondary.

It is principally through verbal associations that cryptogams have suffered. This has come about in at least two ways: uniformity and bias — firstly, a prevalent mechanistic view or assumption that all words in science have to be equal both in precision and in function, while words that do not conform are somehow unscientific (a view which holds that meaning is what matters, and which totally ignores associations); and secondly, there is a surreptitious angiosperm bias in much of our botanical vocabulary.

### **1. Uniformity**

Words, in our profession, come, like statistics, in

all levels of precision, from the sharply defined to the vague, and it is of the utmost importance not to be blind to these distinctions, and in particular not to try to force all words into uniformity in this respect, like so many machine-made bricks. We need to speak of both cones and strobili, and to discriminate between them.

The non-uniform nature of words, even of scientific words, should be a source of strength, not weakness. There are more keys in music than C-major, more colours in painting than the primary red yellow and blue, and a far greater range of kinds of words, thank God, than the sterile verbal homogeneity that has become the brand (and the shame) of taxonomy.

There are words that are sharply defined, words that are loosely defined, words that are rich in associations, and others that are clinically sterile. All of them have their place, and it is weakness, not strength, to use only one part of this rich palette. The older words tend to be words with a much greater superstructure of associations, and hence they are more difficult to handle; the easy way round this difficulty is to invent new words, or else to mutilate the old one by chopping off the associations, re-defining them more strictly. This mass-production mentality is the kind of attitude that feels that Poaceae is better than Gramineae, or Asteraceae better than Compositae, just because it has a similar ending to other family names; that the number system used by biologists ought to be the same as that for physicists, even though the requirements in practice are very different, which leads to such absurdities as "persons to the minus 1" instead of "per person"; that insists on c.g.s. units for every physical measurement except windspeed and ship speed; and on metrication even when division by three is a frequent requirement. The point is that standardization and uniformity are not unmixed blessings in any field of activity, and to enforce them is to enforce constraints on human achievements. Why should uniformity be considered even desirable, as a principle, when flexibility adaptability and variety are generally held to be the hall marks of the best human minds? I abominate and distrust conformity for its own sake — the herd psychology. All this springs from the cult (or the curse) of the tidy mind. It was, I think, what Rutherford meant by his famous jibe

that science consisted of physics and stamp-collecting.

This misconception, of the uniformity of words, is favoured, no doubt, by the mechanical uniformity that tends to accompany the use of computers, by the separation of the two cultures, and by the atrociously utilitarian view of education, governed by accountants rather than teachers, that sees no value for a scientist in the literature of poetry and prose, nor in the study of the classics. I am profoundly thankful that I had my schooling in the Scotland of 50 years ago, at a school where the belief was that, for a pupil of reasonable ability, the ideal option was a combination of science and classics.

I was brought up in the belief, which I still hold, that there are no true synonyms in English, no two words that are completely interchangeable. English, in fact, is like a huge and complex Venn diagram of intersecting circles, each circle being a word, encompassing its associations, whose overlap with other words may be very small or nearly complete, or which may be completely enclosed by another word, but in which no two circles are ever precisely coincidental.

One of the main ways in which word associations mislead us in botany nowadays seems to be through the feeling that certain words are old-fashioned and inferior — that gynaeceum is somehow a better word than pistil, hepatics better than liverworts, and even (heaven help us) plant science better than botany.

The importance attached by so many to cell biology and genetics, in relation to botany and zoology, stems in part from a misunderstanding of words and their associations — the ambiguity between the two meanings of fundamental: structurally foundational, and of prime importance. The former I accept, but not the latter, without substantial qualification. I think, in any case, that if I were a cell biologist I would prefer my discipline to be associated with the overtones of foundation, rather than those of fundament.

## 2. Bias

Another way in which associations mislead us surreptitiously lies in the hidden taxonomic impli-

cations, none more so than with the common word "plant". We read again and again titles such as "The plants of Victoria", "A plant-list for Wagga Wagga", or "Plant communities of the rain-forests", even (and I quote) "A detailed inventory of the major plant communities", where it is vascular plants alone that are intended and not a single non-vascular plant receives a mention. The inherent bias is, of course, self-reinforcing, as the wrong usage spreads.

The word is not under scientific control, it is a non-technical word, and it is these non-technical words that are the most difficult to master and hence the most dangerous. But they exist, and we must learn to handle them with familiarity and understanding. For example, many mycologists would not agree that fungi are plants — but they are whether they like it or not. Many of them may not belong to the Plantae, but they are still plants, and the two terms are not synonymous. Similarly, I would go so far as to claim that the Cyanophyta are algae despite being Procaryote, and the Oomycetes fungi, although the argument in these instances is somewhat weaker because algae and fungi are less well-established as words in everyday use and a case could be made that they are taxonomic categories. The leaves of mosses are probably not morphologically homologous with those of Angiosperms, and there have been those people who insist on calling them phyllids, thus squeezing the ordinary English word "leaf" into an unjustifiably restricted meaning. How any of us, panicked into self-reformation by our approaching demise, is going to turn over a new phyllid, I cannot imagine. If moss leaves are phyllids, angiosperm leaves (if indeed they are even homologous among themselves) are presumably phylla, but that isn't a term I've encountered, except in Greek. There is a general principle at stake: that ordinary English words in common use can never be changed by legislation, although they may gradually evolve.

Whether you accept my argument or not, you will at least see that there is a strong angiosperm bias in the words. If the leaves of Angiosperms and mosses differ, it is the moss leaf that has to be re-named, not the reverse. By analogy, I disapprove of Scottish nationalism (quite a different thing from Scottish patriotism) because I have seen no convincing grounds for giving England her independence. To argue otherwise, is an assumption of inferiority

which I cannot accept. I find feminism distasteful for the same reason.

Having now alienated half of the audience, let me continue — and thereby alienate the other half! The fact that you cannot apply the same argument to the relative positions of mosses and Angiosperms shows how deeply entrenched is the dominance of vascular plants in botanical concepts and vocabulary — and for obvious historical reasons. The very nature of our current system of nomenclature, unobtrusively reinforces the bias towards Angiosperms, because it presupposes a hierarchy of species within genera. And the basis for such a hierarchy, implied but not stated, is some kind of evolutionary tree with the cryptogams at the bottom and the Angiosperms at the top. It is increasingly common, especially since the advent of cladistics, to assume that the ideal way to arrange plants is so as to reflect their putative ancestry, the supposed course of evolution. I think that we should be prepared to consider that while there should always be ideally only one correct name for a species, there is not one arrangement or classification, there may be many equally valid in different contexts.

When people seek to replace words with more technical ones, it is usually the associations that they are trying to get rid of, rather than changing the meaning. For example, in mosses there are three words for the median strip of elongated cells, more than one cell thick, which runs down the centre of the leaf of many species. The old term, which many prefer and still use, is "nerve", and another is "midrib". The first is felt to be old-fashioned and to have undesirable zoological associations; the second is felt to have been used for angiosperm leaves, and therefore to be unsuitable for use in mosses because it is analogous not homologous. So the word "costa", which has virtually no associations, is used. The meaning is the same, but the associations have been pared away.

The introduction of sterile terminology of this sort seems to me to be one of the causes of disunity in the botanical community — creating a jargon which is incomprehensible not only to non-botanists but to many botanists as well — increasingly so as Latin and Greek disappear from the education systems. The jargon of cladistics, of electron-microscopy,

even of modern anatomy and physiology and morphology, has undergone the same process, adding their contribution to disunity among botanists. The old idea of maximum comprehensibility to all is dying a lingering death, although there were still some noted practitioners like Corner and Bill Williams in the literature of not many years ago, whose writings give pleasure by the simplicity with which complex ideas are lucidly expressed. Think of John Donne, one of the two or three greatest poets in the language (and some would argue, the greatest) but who managed to use the scientific terminology of his day for the most profound poetic purpose. You may argue that this change to greater technicality and incomprehensibility has happened in every scientific discipline, and it probably has, but disciplines that are big enough can afford to be split up — botany cannot.

### Conclusion

The schismatic quality of modern botany, I now realize, was probably predictable from first principles, if only I had assimilated Martin Canny's remarkable paper "A universe comes into being when a space is severed", the keynote address at the Australian Ecological Society's symposium on gradients and boundaries in 1980. There will be

found, as Property 4, "Interaction across a boundary favours the side with the higher variety which feeds upon the other side and may absorb it". This is a principle that seems to apply to society, companies, nations, ecosystems and even academic disciplines. "United we stand, divided we fall", and "Divide and conquer", and "It takes money to make money" are all aphorisms rooted in that same property of open systems, which are all relevant to the precarious position of botany as we know it. Where botany and zoology departments merge — virtually throughout the world — zoology (which almost always tends to be of greater size and hence variety) almost invariably becomes dominant, and botany becomes so subjugated that even the joint term "biology" is frequently subsumed as a synonym of zoology.

This is not a complaint, it is a plea for unity and hence for diversity. If angiosperm botanists expand their empire at the expense of cryptogams, or if mycologists push their risky — indeed suicidal — claim to be excised from botany altogether, the properties of the boundaries between the disciplines will lead (if it has not already done so) to the demise of botany. I recommend that paper to your serious consideration. The motto for botany should be "Prosper with cryptogams, perish without".

### It never rains

David Morrison  
Department of Applied Biology  
University of Technology, Sydney

Following the ASBS "Origin and Evolution of the Flora of the Monsoon Tropics" symposium, at the Kuranda Rainforest Resort near Cairns, a number of the delegates participated in the three-day Post-symposium Field Trip through the wet and monsoon tropics. It was suggested that the most appropriate person to write a report on this trip was a certain former Newsletter editor — sillier decisions have been made in history, I'm sure, but I can't recall any of them just at the moment. Still,

I accepted the role, and made suitable notes throughout the excursion, for later use as evidence when the events were denied.

This trip was indeed an experience not to be missed, although perhaps not in the way that the organizers intended. I will, of course, concentrate on these experiences, rather than on any vegetation that may have been incidentally glimpsed by the participants along the way. However, I should perhaps claim at this point that the characters in this report, and their actions, have no relation to those of actual people, alive or dead (or wandering the night in ghostly torment), except by coincidence — this may get me out of an enormous amount of future difficulties (and keep me at least a few of my friends).

The trip started with the usual forgetfulness that seems to be cultivated by a certain type of scientist, and this rapidly became an epidemic. Jenny Chappill forgot to have breakfast, Judy West forgot to return her room key (she may still have it, for all I know), Mike Crisp forgot to get his rolls of camera film out of the fridge (he later donated them to John Clarkson, but failed to admit that they were past their use-by date), and Jeannette Ridder-Numan, Hubert Turner & Annette De Priester forgot to get their valuables out of the resort's safe (which meant that they *remained* safe). Heinz Mueller (our bus driver) also became infected, leaving his car keys in the pocket of his *other* trousers, thus having to drive the bus home at the end of the trip while his car sat forlornly at work. Later on, Bruce Wannan admitted that he had forgotten to tell us that he had holidayed in the same place last year, and that it had rained on him the *entire* time — this was somewhat prophetic, and he was wise not to have mentioned this earlier. Things settled down a bit after this early contagion, although Klaus Querengasser's umbrella is apparently still propping up a fence-post at our final stop, and the book that Jeannette was reading is sitting dejectedly somewhere at Singapore airport.

Our guides for the trip were John Neldner and Bruce Gray, both of whom made sure that they got even with John Clarkson for conning them into making this trip. Apart from a chronic inability to tell the right-hand side of the bus from the left, and no knowledge of how to operate a slide projector, they performed their role with flair and sagacity. They both understood the first rule of a being a guide: *never* contradict the other guide (this also applies to the relationship between academics, by the way). Consequently, all of the plants were identified only *after* they were sure that no prior pronouncements had been made, and the names were then uttered with confidence and decision. However, the sight of Bruce pouring sugar onto his salad in mistake for salt did not inspire complete confidence in his identificatory abilities.

Damian Milne and Rebel Elick constituted the invaluable support staff. Rebel's job appears to have been to increase the biomass of the participants as much as possible, which she achieved by feeding

them enormous quantities of cakes and pastries at every opportunity that presented itself. These opportunities consisted mainly of the morning and afternoon "smoko" breaks (which nomenclature shows you how socially behind the times they are in far north Queensland). However, Rebel's confusion of your correspondent with a certain small television dog of similar name suggests that she probably shouldn't be allowed to label plant specimens.

Damian clearly had the most difficult job on the trip, which he attempted to solve by insisting that he and Rebel regularly swap seats in the LandCruiser, so that he would go deaf in both ears at an equal rate. He bravely lasted until the final evening, when he ultimately capitulated, and begged to be allowed to ride safely in the bus with the rest of us — this plea was accepted in appreciation of his expertise at swinging a billy while making the tea.

The other twenty-four participants were a fairly motley crew, distinguishable mainly by their wide variety of hats. In fact, no two people were wearing exactly the same type, which must have been difficult to organize. They varied from Mike Crisp's elegant baseball cap and Hubert's rather scruffier one, through various versions of the akubra, some floppy cotton ones (from the rest of the Dutch contingent), Bruce Wannan's straw hat and Dinah Hansman's beribboned one, to the one that made your correspondent look like he was auditioning for the role of one of the witches in "Macbeth". Judy West and Judy Egan were also wearing matching sun-glasses, which appear to have been rejects from the making of the sequel to the "Blues Brothers" movie (Bruce Wannan was wearing the original model).

The sociology of the participants was interesting to observe, although most of the details must be forgone, for obvious personal reasons. Having more-or-less randomly arranged themselves in the bus (a Mercedes Benz Unimog 4WD, the macho image of which seemed to fascinate the passers-by, many of whom took photos) on the first morning, it was only the cladists who then re-arranged themselves on subsequent days, presumably so as

not to foam all over each other. There was a clear transformation series among the couples, starting with Jo Palmer and Chris Marshall who were never seen more than four metres from each other, through Hubert and Annette who sat next to each other but were only occasionally together otherwise, to John and Beth Williams who very rarely even sat together — this is apparently an ontogenetic sequence that all relationships go through.

John Neldner attempted to deal with the sociality of the overnight accommodation arrangements by employing cladistic analyses, but many of the synapomorphies used to form the room groupings were clearly not robust. Indeed, the only consistent clades were the three couples, and their synapomorphy is presumably the result of convergence due to hybridization rather than being shared by common descent. Bob Parsons was always the outgroup (voluntarily, I might add), thus ensuring that he always had a room to himself.

The weather, or Clarkson's Revenge as it became known, was definitely consistent — it was always raining in the wet tropics (on the coast) and it was always sunny in the monsoon tropics (further inland). This engendered a slight degree of dissatisfaction among some members of the party, who had heard rumours that parts of coastal Queensland experience a periodical dry season (the tour notes explicitly state that "July is part of the dry season"), and we were keen to test this empirically. However, the inclement weather on the coast disrupted the trip right from the start (the tour notes prophetically state that the Bloomfield River track "is frequently closed after heavy rains"), and the neatly organized itinerary degenerated into a desperate attempt to visit the planned locations in a totally different temporal sequence — we saw the long road between Cooktown and Lakeland Downs *three* times, which is not really justified by any intrinsic physiognomic interest.

Our first stop on Day 1 (which was originally intended to be our last stop on Day 3), somewhere between Mount Carbine and Palmer River (after a brief rest at Bob's Lookout, where we all enjoyed the first sunshine that we had seen for days), was in a eucalypt woodland just north of the *Eucalyptus miniata* woodland that we were supposed to have

stopped in (this was to be the first of the occasions on which Rebel and Damian overshot the mark — the support vehicle had to retrace its steps at least *eight* times during the trip, in search of the agreed-upon meeting places; this may have been a consequence of Rebel's apparent use of echolocation as a homing device). It was here that we first discovered that we were expected to consume enormous quantities of cakes, and consequently the women had to quickly develop their strategies for dealing with this while retaining some sense of decorum. The most common strategy (first displayed by Jenny, who hadn't had breakfast, remember) was to claim that they only wanted to have *half* of a muffin, and then to come back a few minutes later to have another half-muffin. This procedure apparently allows you to consume an entire muffin without having actually done so — this fools no-one, and yet one by one, as the morning and afternoon teas mounted, the other females all came to adopt the same stratagem (except for Judy Egan, who insisted that she prefers green vegetables to sweets — but she can probably be cured).

It was also here that our guides pointed out that *Eucalyptus clarksoniana* requires only a small nomenclatural change to its gender to produce the common name Clarkson's Bum Gum, which is the name by which it is locally known. It was also here that Mike Crisp realized that, in spite of his frequent exhortations to his own undergraduates, he hadn't brought his hand lens.

Our next stop, just north of Palmer River, was to view a deciduous vine thicket, which allowed us to burn off the kilojoules that we'd just acquired, since this vegetation only occurs on the top of rocky knolls (being surrounded by frequently-burnt savannah). Lunch was at the relatively sophisticated Lakeland Downs Hotel, where the gentlemen's is labelled "Pee Nuts" and the ladies' is "No nuts". As Mike Crisp discovered, they also have a phone that is quite happy to accept your coins but is loathe to actually connect you to another phone.

During the afternoon we had a look at the permanent wetland around Kings Plains Lake, where Bruce Gray risked a crocodile-induced death to collect some *Nelumbo nucifera*; and we then had a rushed look at the Cooktown Botanic Gardens,

before afternoon tea. We then took a rather wet look, in a boat, at the mangroves along the Endeavour River, where Hubert, Mike Pole and Pieter Baas demonstrated the art of how to collect plants without needing to leave the vehicle (you have the vehicle driven *into* the potential specimen rather than past it).

We spent that night at Home Rule, nestled in the wet eucalypt forest near Rossville. The road into the establishment is a track that even a goat would think twice about traversing, and yet it is clearly marked with a 100 km/hr speed limit sign — no wonder these Queenslanders have an unenviable reputation for their collective driving technique. Home Rule is even more sophisticated than Lakeland Downs, with geckos and sunbirds living in the dining room and skinks living in the toilet bowls. The owners had to distribute towels to those participants who hadn't read their tour notes, and therefore didn't bring them, and also extra blankets to the women, notably Judy Egan who demanded five (in addition to the one she already had on her bed — it seems that Cairns is a lot closer to Antarctica than is Darwin).

The nighttime events were variable, starting with a round of John Neldner and Bruce Gray's holiday snaps (all of them disappointingly of plants), and continuing with a spotlighting trip that saw only cows, horses and bats. The excitement mounted, however, when Mike Crisp missed his way on returning from the conveniences at 4.30 in the morning, and entered the ladies' dormitory by mistake. His surprise at finding a woman in his bed woke the entire room, thus forcing an embarrassed retreat back to his own dormitory. I'm not sure why he was surprised to find a woman in his bed, since he's married and this should therefore be a rather routine occurrence in his life.

The next morning we travelled back round through Lakeland Downs, passing the elegantly expressive sign saying "Cooktown. Wrong bloody way you bastards! Go back!", and arriving at the Split Rock Aboriginal Art Site, just south of Laura. Here we were again expected to burn off the kilojoules after morning tea, this time by climbing up to look at the aboriginal rock paintings and the panorama. This was our hottest weather, and our highest climb (up to Turtle Rock). The track was clearly not meant for

people with short legs, as Jenny discovered, who was also being used as a packhorse by Carol Wilkins, one of her postgraduate students, which is an unacceptable reversal of the usual roles. It is fortunate that they found some of the species they were looking for (jacksonias, for example), or tempers may have become frayed.

We nipped in to Laura for lunch, where Judy West spent her time fretting about whether to ring CSIRO's Atherton office to harass them by discussing work (she fought off the temptation this time, but eventually she capitulated). We then travelled around to Olive Vale and Lakefield National Park, to compare the floristic variety of the different eucalypt woodlands on the various substrata, and so that everyone could photograph the orange-flowered *Eucalyptus phoenicea*. We then traversed the Battlecamp Range sandstone (while John Neldner tried the collecting-from-a-moving-vehicle technique), until Heinz made the mistake of opening the bus door at an unscheduled stop that immediately ceased to be as brief as he wanted. At Isabella Falls (which is actually a cascade, but has presumably been re-named for tourist purposes) we met Bob Makinson, Ian Telford and John Conran, all of whom were supposed to be travelling much further south — even out there you can't get any privacy.

We spent that night in Cooktown, where we first attended a reception at the Vera Scarth-Johnson gallery, put on by the townspeople. This soiree was presumably for the entertainment of the locals, who must have got a bit of a shock (we even made it into the local newspaper, as "a high-powered group of botanists"), although no-one was more surprised than Vera, who when she asked to see her *Canavallia* painting was shown Bryan Barlow instead. Bryan (who, with his wife, was actually supposed to be on holiday) and Judy West spent much of the dinner hour on the phone, dealing with some work crisis that someone thought they should be rung up about, and the rest of their time was spent foaming at the mouth with Pieter, Hubert, and Mike Crisp — clearly the seating arrangements needed to be made with more care. During the pre-dinner rest, Gary Wilson and I had been disturbed by the giggling and carrying-on that was occurring in the ladies' room next door, but discovered later that it was only Mike

Crisp's presence among them *again*. The staff must have been glad when we left, especially after we demonstrated that scientists are chronically incapable of correctly filling in forms as simple as motel breakfast menus.

The next morning we went for a long drive back south (with a brief stop to look at the black blue-green algae on Black Mountain, which not unexpectedly smells like an aquarium) to where we had had morning tea on the first day, but this time managing to stop in the right place. However, Rebel

and Damian had not yet arrived with morning tea, having been delayed in Cooktown waiting for the shops to open so that they could buy Mike Crisp some more film for his camera. They made up for their delay, however, by producing a completely different and much larger set of cakes. It was here that the official group photos were taken, thus showing the participants at their maximum biomass. We then drove round through the ranges to Mossman Gorge on the coast (which should have been our first stop on Day 1), pausing to admire the panoramic view of the thick mist at Rex Lookout and the



#### Photo caption

**Back row** (left to right): John and Beth Williams; Jeannette Ridder-Numan; Pieter Baas; Annette de Priester (wearing the witches' hat); your correspondent; our President (in "student excursion" mode); Bruce Wannan; Dinah Hansman; Klaus Querengasser (at the back); Chris Marshall; Mike Pole; Judy Egan; Petrus Heyligers; Bob Parsons; Carol Wilkins; Jenny Chappill; Hubert Turner (at the back); Bruce Gray.

**Front row** (left to right): John Neldner; Helen Hewson (apparently standing in a hole); Gary Wilson; Damian Milne; Tony Edwardson; Judy West; Jo Palmer. Rebel Elick took the photo, and Heinz Mueller wisely kept out of the way.

slightly-less-thick mist at Lyons Lookout (although the view was eloquently described for us by our resourceful guides).

Rebel and Damian were late with the luncheon sandwiches (which, for some people, were a welcome change from the large-style Australian meals that we had previously encountered), but they just managed to make it before the participants had disappeared irretrievably into the rainforest. Mossman Gorge is a popular tourist spot, and so plant collecting had to be more circumspect. Nevertheless, some of the party managed to bring back a goodly supply (including Jeannette's seedling, collected by Bruce Gray, which made it alive back to Leiden), and Mike Pole returned with an unintentional supply of leeches. Our final stop was the Mardjia Botanical Walk, just south of Cape Tribulation, which wanders through the rainforest and out into the mangroves. This time it was Mike Pole and Carol who were the ones requesting that we distract the tourists while they surreptitiously ransacked the shrubbery.

Gary apparently wasn't as discreet as he intended, and only managed to be furtive instead. While excising a male strobilus from a *Bowenia*, he realized that he was under observation by a tour guide from another bus. This guide said nothing to Gary, but conspicuously kept his eye on him after Gary returned to the rest of the group, and the guide then had a quiet word to Heinz. It turned out that Gary had put the strobilus to his nose to smell it after he had collected it, and the guide thought that he had eaten some of it, and he was therefore waiting for him to drop dead because he knew that they are poisonous.

Just as we were finishing afternoon tea, Pieter found a flowering plant and decided to take a closer look, discovering in the process exactly why *Dendrocnide* are commonly known as Stinging Trees. Considerable concern for Pieter's future welfare was shown by everyone, except for some of the cladists (who had heard of poetic justice), although they seemed to be more interested in Heinz's use of masking tape to remove the nettles from Pieter's arm. Even more interest was shown in Bruce Gray's suggested treatment (get a bottle of rum, drink the rum, then rub the empty

bottle on the affected area), although it was not until they realized that it was Jeannette who was solicitously rubbing ointment on Pieter's arm that several of the participants rushed off in search of the same plant.

The farewell speeches during our trip back into Cairns were interminable, with a wide range of people determined to have the last word. It was Heinz who succeeded, expressing his pleasure at the promptitude with which the bus was vacated at every stop, his frustration during the attempts to re-fill the bus afterwards (including Klaus and Mike Pole's extensive photographic equipment), and his sadness at the pillaging that taxonomists habitually indulge in (irrespective of whether they have governmental permission or not) when shown plants in their natural habitat. We then said goodbye to several of the participants, while the rest of us spent that evening in Cairns, much of the time trying to sort out missing or misplaced luggage.

The dinner for this final evening was left to the small remaining group to organize, which was a mistake that needs no further explanation. The restaurant chosen served Greek food and Turkish entertainment; the food was plentiful and good while the entertainment was loud and eccentric. The highlight was Chris being chosen by the larger of the two belly dancers to join her in providing the divertissement (while Bob had earlier been chosen by the same lady to become immodestly entwined in her lengthy veil). Chris took his involvement in this role well, and performed creditably. I will not attempt to describe the performance in detail, since this is a family newsletter, but Jo will clearly have to keep a close eye on him in public. With any luck, this will be the most embarrassing event in Chris's life, and he can look forward to a carefree future.

The unusual combination of Turkish and Greek culture seemed to be surprising to our Dutch guests, and it is obviously the product of our multicultural society. However, what surprised them even more was the rather raucous hen party going on at the adjacent table. The social dynamics of young women who are becoming increasingly inebriated are presumably rather similar throughout the western

world, although northern Australia clearly has its own uniquely derived features. What surprised *me* most about the restaurant was the rather gratuitous smashing, by the waiters, of specially-purchased plates during the sirtaki (group dancing); interestingly, this behaviour was predicted by Pieter, who clearly has considerable acquaintance with southern European gastronomy.

Not unexpectedly, our drinks bill was larger than the food bill, helped largely by the three bottles of retsina (plus a bottle of red wine) consumed by a very small number of people at one end of the table. Pieter and myself must take some responsibility for this, along with Bob and Klaus, although Jeannette helped unwittingly — while either Pieter or myself distracted her the other one topped up her glass, so that she had no idea how much alcohol she had actually consumed. This is a time-honoured technique employed by men of all ages and nationalities, and I am surprised that her mother didn't warn her about it when she was younger (perhaps her mother did, and marriage has made her less vigilant, or more trusting).

My own mother warned me, many years ago, that it is always the quiet people to watch out for, and this advice was amply justified when Tony Edwardson came home in the wee small hours of the morning rather pleased with himself for having found a blues club to visit. Petrus Heyligers also remained quiet throughout the trip, his sole disconcerting behaviour having been (also many years ago) to name his daughter Yucca; while Helen Hewson spent her time on the trip collecting lower plants and was thus ostracized by the rest of the party.

It was on the next and final morning that we had a chance for a detailed examination of the Crisp collecting technique, which works as follows. First, you collect your specimen; however, you do *not* at this point label the specimen in any way. You then put the specimen in someone *else's* plant press, and proceed to forget about it for several days. On the last morning of the trip, after everyone else has already sorted out their neatly labelled specimens, you attempt to find your collections in order to move them to the plant press that is being transported to your home city. At this stage, you discover that your

unlabelled specimen is missing, and begin to resign yourself to its irretrievable loss (consoling yourself by remembering that you only collected it for your postgraduate student, and that it's loss is thus of no real consequence). As one last resort, however, you ask Mike Pole if it's in his press, and are informed that it was last seen on the floor of the bus. You then go and *re-collect* the specimen, this time from the hotel's front garden, where it has been carefully placed pending its return to the soil from whence it came. Only *now* do you correctly label the specimen, and place it in some organized fashion in the plant press (while everyone else is waiting patiently for you downstairs).

During the day, in dribs and drabs, most of the participants slunk quietly out of town, to return to their colleagues and families, spending their time in the transit lounge at the airport preparing their vigorous denials of all of the events detailed in this report. I was on the last flight out during the evening, sitting alone in the lounge watching the sun go down on the trip both metaphorically and literally. Yes, it was true — the sun had come out at last in the wet tropics, for the specific purpose of emphasizing that it was all over.



## PERSONAL NEWS

Andrew Douglas: New fella at the National Herbarium of Victoria

A three-year Scientific Fellowship was created recently as part of a larger sponsorship arrangement between Pacific Dunlop and the Royal Botanic Gardens, Melbourne. Andy/Andrew Douglas, fresh from a highly successful Ph.D. defence at the University of Louisiana, U.S.A., was selected as the Pacific Dunlop Fellow. Andy arrived in Australia on the 12th of August, and within a week had a house, a fridge, a pastie and a research program. Ellen and 18-month old Toby are equally at home in Melbourne.

By 1999, Andy hopes to have untangled some of the phylogenetic relationships and macroevolutionary processes and patterns in Proteaceae, Menispermaceae and Leguminosae. To examine the inter-generic relationships within Proteaceae, he will compare gene sequences as well as the morphology of flowers, leaves, woods and inflorescences. At a more theoretical level, Andy will delve into ontogeny as a means of elucidating phylogeny.

Once Andy has finalized his research program (and spent some time plucking flowers in the local bush) I'll badger him into writing a more intimate account for the *Newsletter*.

## REPORTS



**Australian  
Botanical  
Liaison  
Officer**

The last year has passed extremely quickly, as it seems to do for all Liaison Officers. Kew has felt like home to us for many months now, and we have enjoyed our time in the U.K. immensely.

The last quarter was fairly hectic, with visits to the herbaria in Vienna, Geneva, Florence, and Leiden. This was my second visit to Leiden this year, as the week in January was simply not long enough. Leiden is an essential stopover for anyone working on tropical Australian plants, because of its rich

collections from the Malesian archipelago. A visit to Florence in August is not recommended because, apart from the likelihood of the weather being very hot, many people in Italy take their holidays at that time. I was lucky to be able to make a short visit before the university closed for the summer break in mid-August. I intended to visit Florence a bit earlier than I did, but various circumstances prevented me from doing so. April and October are regarded as the best months to visit Florence.

Brian Schrire and Dick Brummitt each gave a seminar on the controversial topic of monophyly versus paraphyly in defining genera. This was a practice-run in preparation for the recent AETFAT Congress (Association pour l'Etude Taxonomique de la Flore D'Afrique Tropicale) in Wageningen, which was held a couple of weeks ago. A substantial contingent of people from Kew who have an interest in the African flora attended.

A recent initiative in Britain has been the setting

up of the U.K. Systematics Forum, in response to a report by the House of Lords Select Committee on Systematic Biology Research. The stated primary role of the Forum is to improve co-ordination and communication and to develop priorities for systematic work. A questionnaire was recently sent to practising systematists in the U.K., so that a database of areas of expertise and current research could be compiled from the information received. Dr Steve Blackmore at The Natural History Museum is the chairman of the U.K. Systematics forum.

Barry Conn has taken over from me now. He has begun planning his first trip to continental herbaria, and has asked that people send requests for tasks at

other herbaria as soon as possible, because at the time of writing he was intending to leave in October. The places he ultimately visits and the time spent there will depend in part at least on the requests that he receives.

I would like to take this opportunity to thank the curators and staff at the various herbaria that I visited for all their assistance, and I would like to say a special thanks to my friends and colleagues at Kew and the Natural History Museum.

Laurie Jessup  
A.B.L.O.



**Australian  
Botanical  
Resources  
Study**

The second volume in the ABRS *Flora of Australia Supplementary Series, Register of Type Specimens of Mosses in Australian Herbaria*, by Helen Ramsay and Julie Seur has now been published.

The book, B5 in format with a soft cover, and comprising 150 pages, was launched by George Scott at the recent ASBS symposium at Kuranda. It consists of an alphabetical list of all moss names for which there is some Type material (or putative Type material) in an Australian herbarium. Each entry is made up of the name and place of publication, details of the protologue description of the Type, lists of specimens which seem to match this protologue, references to lectotypifications (if any), and the herbaria where putative Type material is known to be

lodged. The entries conclude with notes on various nomenclatural matters, including the currently accepted name for the taxon in question. The book should help to simplify the work of Australian bryologists, in that they can now readily ascertain whether Type material is available in Australia, or whether the search needs to be extended overseas. The book can be obtained from ABRS (Flora), GPO Box 636, Canberra ACT 2601 for \$20 plus postage (\$3 within Australia, \$3 overseas surface mail, \$10 overseas airmail). We can accept cheques, or credit card orders (in the latter case, Bankcard or Mastercard only — please send a signed order including type of card, number and expiry date).

### **Atlas of Northern Territory Rainforest Plants**

The third volume in the *Supplementary Series* is currently being prepared for publication, with a release date of late November appearing likely. This book, *Atlas of the Vascular Rainforest Plants of the Northern Territory*, by David Liddle, J. Russell-Smith, J. Brock, G.J. Leach and G.T. Connors will provide distribution maps of 585 native and 19 naturalized taxa of rainforest plants, based on the records of the Northern Territory Herbarium and a survey of 1,245 sites undertaken over the last 10 years. For each taxon, ancillary information on life-form, fre-

quency of occurrence, endemism, reservation status and conservation status (where appropriate) is given in a convenient coded form at the base of each map. While the maps comprise the major part of the book, they are accompanied by an overview of the biogeography of the region, including its tectonic history, and extensive tables are provided of distribution of 519 NT taxa in other regions worldwide. The book will provide a very useful overview of this important element in the Northern Territory flora for biogeographers, land managers and ecologists, and will be a useful tool for *Flora* writers in particular, who now have no excuse for not providing detailed distribution maps of these taxa, for the NT at least, for the *Flora of Australia*.

No price was available at the time of writing (somewhere in the vicinity of \$20—30 seems likely), but those wishing to obtain a copy immediately on release should write to me at ABRS expressing interest, and we will send you a brochure and order form.

### Flora of Australia

Editing is proceeding on nine volumes at present. The next to be published will be *Volume 55, Lichens 2 — Parmeliaceae*, which is expected to be in print by late November or early December. This will be followed by the first of the Fungi volumes, which consists entirely of review essays on various aspects of Australian mycology. It should be published in the first half of 1995. We are also hoping that *Volume 16, Proteaceae 1*, might be completed in time for publication before the end of June 1995. A special effort is being made by editors and contributors to try to have *Volume 48* (Pteridophyta and Gymnosperms) published in time for a launch at the Holtum Memorial Pteridophyte Symposium in Kew in July 1995. This is a very heavy publication program for the next 12 months, and there are still a myriad of things that could go wrong, but with the usual cooperation and goodwill of our contributors we think that it is achievable.

### Change of Publishers

It has been decided that, beginning with *Volume 55*, the *Flora of Australia* will be printed and

distributed by CSIRO Publishing in Melbourne, rather than by our traditional partners, Australian Government Publishing Service. CSIRO will also be printing and marketing the other major ABRS series, *Fauna of Australia* and the *Zoological Catalogue of Australia*. There will be no change in format (other than minor details of logos, etc) for the *Flora of Australia*, and the familiar green and gold dustjackets will continue. Availability and ordering details for past and future volumes have still to be finalized, but new volumes at least will be obtainable from CSIRO. We expect the new arrangement to deliver an enhanced marketing effort for our publications, as well as financial benefits to ABRS in terms of reduced publishing costs. These financial benefits will be available for additional publications and/or support for research.

### Flora of Australia Volume 1

A workshop was held in Canberra on 3 June, when a group representing users came together to discuss the content and possible authors for a revised and expanded edition of this key volume. The workshop was most successful, with good consensus reached on virtually all points. A draft plan for the book has been developed, and suggested authors are being contacted, with a view to having the text completed by the end of 1995. This is an exciting project, and a good opportunity to provide an authoritative review of many subjects which impact on the taxonomy of the Australian flora.

### Protists of Australia

Another workshop was held in Canberra on 21—22 May 1994, to discuss what can and should be done by ABRS to bring the protists (*sensu lato*) within our program. The Flora section of ABRS already has plans in place or under development for Flora-of-Australia-type treatments of the fungi and algae. Depending on one's definition of the Protista, these groups are either part of, or abut, the protists. However, there are many other groups, traditionally studied by zoologists (or in an Australian context, studied by no-one!) which merge more-or-less seamlessly with at least the unicellular extremities of the fungal and algal classifications. The workshop devoted considerable time to consideration of

how ABRS might ensure that these groups receive, in the long term, an equitable share of research funding, and how the results of this research might be presented to the broader community.

The workshop recognized that funding for taxonomic research through ABRS was already very tightly stretched, and that no additional major effort could be addressed unless additional funds could be found. However, if funding became available it was suggested that two major descriptive projects were feasible. In the short to medium term it should be possible to compile an overview volume (perhaps along the lines of the *Fauna of Australia*) describing the major groups of protists present in Australia and summarizing the current state of knowledge. This might be done along habitat lines (soil protists, freshwater protists, gut-inhabiting protists, etc) rather than along formal taxonomic lines. At a later date, ABRS might consider publishing species-level taxonomic treatments of groups, as research progressed, perhaps in a format resembling the *Zoological Catalogue* or *Flora of Australia*. In the meantime, existing efforts to treat at least the macroalgae and macrofungi (and perhaps some well-known microgroups in both) in the *Flora of Australia* will continue.

Detailed recommendations from the workshop will be considered by the Flora and Fauna Editorial Committees over the next few months, and they will prepare recommendations for the ABRS Advisory Committee meeting in November.

Tony Orchard  
Flora of Australia

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### Collaborative Project Using Continent-Wide Eucalypt Dataset

Our call for expressions of interest to analyse the continent-wide eucalypt dataset resulted in considerable interest from various fields of biology. As planned, we held a workshop in Canberra on May 4–5 hosted by the Centre for Plant Biodiversity Research and ERIN. The workshop was primarily to familiarize interested parties with the type and

quality of data available, some of the limitations of the dataset, and to discuss possible research and collaborative projects. The 25 participants covered the fields of ecology, systematics, plant geography, computer modelling, ecophysiology, conservation, and land management.

Discussions were lively and catalysed some stimulating ideas. There was a good deal of enthusiasm to use such datasets, to explore different means of analysing the data, particularly to test many of our current biodiversity theories and to search for patterns in this major element of our flora. As always, the workshop stimulated collaborations between scientists who had not previously worked together, and spurred lateral ideas with respect to use and application of these large datasets. Included here is a list of the 16 projects resulting from our synergistic discussions. They are grouped together in common areas of interest. A brief paragraph explaining the concept of each project is also included.

Final cleaning and validation of the combined dataset is now being completed. Participants agreed that we should attempt to complete the collaborative project by the end of 1995, and that we will hold a symposium/workshop early in 1996. We anticipate that the results will be published by mid-1996.

Should you want to know more about the project, or feel that you may want to be involved with analysing the data, please feel free to contact either Pennie Hohnen or Judy West.

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### Groupings of Projects

#### Methodology

- Automatic data validation procedures using *Eucalyptus* (Chapman/Rosenbilds)

- Global patterns in *Eucalyptus* species distributions (Green/Peters)
- Success of models in predicting eucalypt species distribution on Cape York Peninsula (Neldner)

#### **Phytogeography**

- Patterns of distribution in rare and common eucalypts (Thiele/Prober)
- Distribution of vegetation alliances within remnant woodlands and native forests in the Central Western Region, NSW (Goldney/Stone)
- Phytogeography and site characterisation of eucalypts of north-eastern NSW (Bale/Williams)
- Using satellite and climate data to determine the extent to which *Eucalyptus* species are spatially separable (Bullen)
- Distributional ecology of *Eucalyptus* in Tasmania (Williams)
- Biogeography of *Eucalyptus* in Victoria (Whiffin)

#### **Linking to environmental envelopes/domains**

- Comparison of intra-specific provenances definition in localized and widespread eucalypts based on climate and river catchment methods (Morse/Gardiner)
- Quantitative evaluation of relationships between eucalypt taxa, faunal habitat attributes and environment regimes (Norton/Williams)
- Vulnerability of species to future climate change (Hughes)

#### **Character states/attributes**

- Ecological characteristics of the eucalypt sub-genera (Noble/Ladiges/Brooker)
- Fire-adaptive characteristics of *Eucalyptus* in Australia (Gill/Brooker/Belbin)

#### **Conservation status**

- Chronology of eucalypt collections, systematic concepts and assessment of conservation status (Hopper)
- Inferring conservation status from scientific collections (Burgman)
- Representation of eucalypt species and species assemblages in protected areas through time (Cresswell/Pressey/Bolton/Thackway)

#### **Human population effects on biodiversity**

- Assessment Procedures for linking human population expansion and lifestyle changes on biodiversity (Crome)

#### **Automatic data validation procedures using *Eucalyptus***

Chapman/Rosenbils

This project will use the large eucalypt dataset to test methods of automatic error detection and reporting, and to use this information to improved data quality assurance methodologies. ERIN has developed automatic methods for identifying and reporting on point records that are regarded as suspect from a geocoding point of view. This process involves the use of climate as a surrogate to identify outliers in distribution patterns, using x, y and z co-ordinates. Records that undergo the validation tests are sent back to data custodians for verification. Results of this process will be analysed to determine the efficacy of the present validation procedures. Analyses will also be carried out on the criteria by which suspect records are identified, with the aim of improving the process. The eucalypt data represents an ideal dataset for testing these validation procedures, as it includes species with few to many records and covers almost all climate types in the country. It is expected that this will provide an improved method for validating point-based biological records using automatic outlier detection. This project has major implications for data management and quality assurance with respect to biological data in Australia and elsewhere.

#### **Global patterns in *Eucalyptus* species distributions**

Green/Peters

The *Eucalyptus* dataset makes it possible to examine continent-wide distributions in detail. This project aims to develop and verify methods for predicting the "potential" distributions of individual species. We will apply algorithms that have been developed in recent years to extrapolate distributions from climate, landscape, and other environmental variables. Tests of validity will include re-sampling, cross-checking and robustness. The resulting maps

will show the best possible predictions of potential distributions, plus confidence envelopes and other indicators of reliability. These outcomes will help to identify potential issues in conservation. Scientifically, the study is likely to lead to greater understanding of the role of landscapes in evolution and in the formation of communities.

**Success of models in predicting eucalypt species distribution on Cape York Peninsula**

Neldner

*Eucalyptus* species dominate the majority of Cape York Peninsula. Over the last 5 years, a survey conducted by the Queensland Herbarium as part of the Cape York Peninsula Land Use Strategy (CYPLUS) has mapped and sampled the vegetation of this area at 1:250,000 scale. The substantial ecological database collected, together with the herbarium collections for the area, will provide data to model the distributions of *Eucalyptus* species and species assemblages. It is planned to initially use BIOCLIM and GARP. The output from these models will be compared to the vegetation mapping coverage in the GIS. The 1:250,000 CYPLUS geology, soils and regolith coverages will then be incorporated into the analysis, to more narrowly define the predicted distributions. An assessment will be made of the ability of the models to predict realized *Eucalyptus* species distributions and the data requirements for acceptable predictions.

**Patterns of distribution in rare and common eucalypts**

Thiele/Prober

The large eucalypt dataset will be used to assess the extent to which congruent distributional edges can be found within a continental flora. Maps for each species based on geocoded site locality records will be generated in a fixed format for input into an automated cell-based edge-searching routine. All edges will be "stacked" to generate a continental "topology" showing (hopefully) areas or lines of congruence. These may delimit areas of endemism or regions of other interest. If such areas can be generated, they will be compared with regionalizations based on other methods, and be used

for an assessment of geographic patterning of narrow endemics versus "wides". Might work.

**Distribution of vegetation alliances within remnant woodlands and native forests in Central Western Region, NSW**

Goldney/Stone

This project is an important component of a broad program of research that is attempting to assess, document and map the conservation value (vegetation health, habitat attributes, degradation) and vegetation classification (alliances) of the fragmented vegetation within the CWR. There is an urgent need to provide these resources, and to model and document the links between ecological processes and the vegetation remnants at a landscape scale. This will provide ecologically sound prescriptions for biodiversity conservation and land management. Collaboration with the Centre for Plant Biodiversity Research will enable us to use appropriate data from the eucalypt dataset with our own data, to predict the distribution of vegetation alliances utilizing GIS modelling, i.e. using vegetation surrogate coverages generated from geology, soils, climate models (e.g. BIOCLIM) and digital terrain models within the domain of the present vegetation remnants (from NSW NPWS Broad Vegetation coverage). These coverages will also be modelled with those from the mapping of landscape degradation processes (erosion, salination, etc.) carried out by CALM (NSW).

**Phytogeography and site characterization of eucalypts of north-eastern NSW**

Bale/Williams

Eucalypt species richness approaches a continental maximum in northern NSW. This project examines the distribution patterns and phytosociology of these species at a regional scale, and seeks to link these patterns with geographic and site attributes. Locally endemic species and species with apparently narrow environmental envelopes will receive particular attention. Some explanations of species richness will be attempted. Patterns derived from the dataset approach will be compared

with output from regional field mapping approaches, including the NRAC Clarence/Richmond project.

### **Distributional ecology of *Eucalyptus* in Tasmania**

Williams

This project aims to describe the distribution of eucalypts in Tasmania at the taxonomic levels of species, series and subgenera. A biogeographic analysis will be undertaken at the generalized scale of the 10 km x 10 km grid square, using a Tasmania-wide database supplemented by the continent-wide data. A more detailed comparison of the ecological traits of selected taxa will be conducted. A comparison will be made of the macro-environmental factors correlated to the distribution of non-endemic Tasmanian taxa, and their mainland occurrences. Rarity, endemism, ecotype occurrence, and species diversity will be considered in the context of the macro-environment.

### **Comparison of intra-specific provenance definition in localized and widespread eucalypts based on climate and river catchment methods**

Morse/Gardiner

This project will make use of the geographic component of the continent-wide eucalypt database in conjunction with BIOCLIM, the ATSC database and TREDAT performance data to examine provenance definition in selected species of widespread and localized eucalypts. This study has two main objectives:- to explore the viability of using computerized data as a basis for objectively defining provenances within a species; and to examine the relative value of climate factors in comparison to geographic distribution (river catchments) as a basis for defining provenance limits.

### **Quantitative evaluation of relationships between eucalypt taxa, faunal habitat attributes and environment regimes**

Norton/Williams

The broad aim of this research is to further assess the extent to which vegetation can be used as a

surrogate for faunal habitat. An improved understanding of this issue is important, as it may lead to the development of more cost-effective methods of biodiversity assessment at the regional to continental scale. More specifically, we aim to determine if taxonomic and functional characteristics of selected eucalypt taxa can be related to faunal habitat and various derived environmental gradients. The continent-wide eucalypt datasets will be coupled with environmental and faunal data held at CRES, ANU.

### **Vulnerability of species to future climate change**

Hughes

This project has already involved analysis of a limited part of the dataset (i.e. records of the Australian National Herbarium only). Data were screened for errors and used in combination with ESOCIM to investigate the following: 1. How many eucalypt species currently have a climatic range that encompasses less than 1, 2 or 3 degrees celsius mean annual temperature? 2. How many species have a range that encompasses less than 20% variation in mean annual rainfall?

### **Ecological characteristics of the eucalypt sub-genera**

Noble/Ladiges/Brooker

There is evidence that the eucalypt sub-genera show distinct suites of ecological characteristics consistent with their broad distributional patterns both at fine scales (ridge to valley bottom) and geographic scales (Noble, I.R. 1989 *Aust. J. Bot.* 37: 207—24). The original work was based on a literature survey, and concentrated on *Monocalyptus* and *Symphyomyrtus* only. A more comprehensive species-by-character database is being assembled for south-eastern Australia by Brooker *et al.* These data will be analysed to seek suites of correlated traits (sometimes called "adaptive syndromes", and similar to "functional types"). Accurate species distribution data from the continent-wide dataset combined with high-resolution environmental databases will assist considerably in interpreting the ecological significance of any sets of correlated traits.

### **Fire adaptive characteristics of Eucalyptus in Australia**

Gill/Brooker/Belbin

We intend to examine patterns in the distributions of species with particular fruit, flower-bud, flower colour, and lignotuber characteristics at a national level. Any relationships between the proportions of species with particular lignotuber characteristics and measures of drought, fire and fuel characteristics will be sought. We will explore the relationship between fruit sizes and flower-bud positions and flower colours, on the one hand, and plant statures and fire regimes on the other.

### **Inferring conservation status from scientific collections**

Burgman

Most of the information that we have for most species is in the form of museum and herbarium collections. It has fallen to the curators and compilers of these collections to provide estimates of conservation status, information that is used to prioritize the allocation of scarce conservation resources. This project will develop and test new statistics that may be used to quantify simulated data, followed by their application to the eucalypt database. The results of the statistical inference of threat to species in the eucalypt database will be evaluated by expert eucalypt taxonomists. This will provide a validation of the methods, and will probably result in some re-casting of the methods and re-evaluation, in an iterative fashion. It is envisioned that the end-product will be public-domain software that may be used by taxonomists and curators to assist in the inference of conservation status for large numbers of plant and animal taxa.

### **Representation of eucalypt species and species assemblages in protected areas through time**

Cresswell/Pressey/Bolton/Thackway

This project aims to analyse the distribution of eucalypts in relation to protected areas, both spatially and temporally. This will involve GIS analysis of the distribution of eucalypts in relation

to selected biogeographic regions in Australia, and to investigate their representation in protected areas. Further to this, the project will analyse the relationship of species and species assemblages within protected areas through time for the selected biogeographic regions. From this, we will evaluate the relationship between the "protection" of species and species assemblages and the increases to the protected-areas estate. The outcome of this research should define a series of options for protection of eucalypt species and species assemblages (within selected biogeographic regions) that seek to account for those which lie outside the current system of protected areas. Products will include a map of the irreplaceability of sites in terms of set conservation goals for the protection of eucalypt species and species assemblages.

### **Assessment procedures for linking human population expansion and lifestyle changes on biodiversity**

Crome

This project will examine the possible relationships between human population expansion in Australia and the conservation of eucalypts. It forms part of a larger DWE project looking at the impacts of population expansion on biodiversity. It will examine the coincidence of eucalypt species and associations with present and projected growth scenarios of Australia's growth areas. It will take the approach of defining ecological footprints whereby the influence of a growth area extends beyond the physical space it occupies. Obviously, the impacts of population depends upon lifestyle, attitude, consciousness, and consumption patterns, not simply on numbers, and an important part of the project will be looking at the mechanisms whereby people impact on this genus. It will be important therefore to link to the conservation-status project group to determine how people are impacting directly and indirectly. These links will also allow expansion of the growth areas to be related to changes in threatening processes on eucalypts of different conservation status.

Pennie Hohnen  
CSIRO Division of Plant Industry

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## ADDRESSES

### Email addresses of ASBS members

This is the updated list, based on the comprehensible corrections and additions that members have notified me about. Some of the addresses are quite complicated, as a number of the computer administrators have clearly not implemented an alias system (whereby a simple alias is used by the recipient, which is translated by the host computer into the full network address; for example, m.coode@rbgkew.org.uk is the alias for mc02kg@lion.rbgkew.org.uk). If you look carefully, you will be able to distinguish zero from oh and one from el.

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## A.S.B.S. INC. BUSINESS

### Sixteenth General Meeting

Minutes of the 16th General Meeting  
Kuranda Rainforest Resort, Kuranda, Queensland

Monday 4 July 1994  
Meeting opened at 5.57 p.m.

#### 1. Attendance:

41 members were in attendance at the General Meeting; Mike Crisp was presiding.

#### 2. Apologies:

Barbara Briggs, Jeremy Bruhl, Marco Duretto, Rod Henderson, Lawrie Johnson, John Neldner, Chris Puttock, Barbara Waterhouse.

#### 3. Minutes of the 15th General Meeting held in Hobart, 20 January 1993:

It was proposed that the Minutes of the 15th General Meeting (as published in the *Austral. Syst. Bot. Soc. Newsletter* 74: 5-9) be accepted as a true record of that meeting (moved Judy West; seconded David Morrison). Unanimously agreed to by the Meeting.

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

#### 4. President's Report:

The President's report was presented by Mike Crisp.

Since the last General Meeting, in Hobart in January 1993, the Society has been quietly going about its business as usual. We have held successful conferences in Hobart, Perth (September last year) and now here in far north Queensland. Looking to the

future, we are committed to meetings almost to the turn of the century:- a cladistics workshop in Canberra next year, the Melbourne Commemorative Conference in 1996, a symposium on ecology and systematics in Adelaide in 1997, and a joint meeting with the International Monocot Conference in Sydney in 1998. Details of these meetings are provided below. I believe that these meetings are the most important thing that we as a society do, because they provide the major opportunity for members from all over the country, and elsewhere too, to meet and discuss our evident common interests. Organising these meetings costs the Society a lot of money, in subsidising keynote speakers, organisational expenses, and student subsidies, but I feel that the money is well worth spending.

For most members, the most visible part of ASBS activity is the *Newsletter*, and this has grown in size and quality during the tenure of David Morrison and Barbara Wiecek, over the last three and a half years. At last they have had enough, and are stepping down, but the sincere thanks of Council go to them for a sterling effort. Our new editors will be the Darwin crew, headed by Greg Leach, and I must say I am pleased to see such a significant decentralization of this essential aspect of our activities.

Speaking of decentralization, it is a truism that ASBS consists of a small number of members scattered thinly over a large continent. As you are all aware, this makes communication difficult. Moreover, with a major concentration of members in the Canberra—Sydney—Melbourne triangle, and there is always the danger that we who live and work there may forget the rest of you. Therefore, I think it a healthy sign that we are decentralizing in many ways. The current Council represents far north Queensland, Brisbane, Melbourne, Canberra and Sydney. The new *Newsletter* editors are in Darwin. Recent meetings have been held in Hobart, Perth and Kuranda — all outside of the triangle. There are also good signs of revival in some of the smaller chapters, for instance in Hobart thanks to the efforts of Bob Hill. I hope that this pattern continues.

Another good sign for the Society is the continuing enrolment of new members — we welcome 14 since the last meeting, plus 21 students who were awarded free membership for a year after they gave papers at the Hobart, Perth and Kuranda meetings. Our policy of encouraging students by subsidizing their contributions to our symposia is paying handsome dividends. Since we started this scheme last year, the number of students participating has increased dramatically, from 3 in Hobart to 7 in Perth and 11 in Kuranda. Hopefully they will be encouraged to continue their memberships, and become the strength of ASBS into the next century. Students supported at the Kuranda meeting are:- Daniel Blanchon (\$150), Lindy Cayzer (\$75), Darren Crayn (\$75), Marco Duretto (\$75), Lisa Ford (\$75), Dinah Hansman (\$60), Peter Jobson (\$50), Emma Pharo (\$75), Jeannette Ridder-Numan (\$75, plus waived registration, value \$75), Andrew Rozefelds (\$75), Alison Shapcott (\$50), Simon Thompson (\$50), and Hubert Turner (\$75, plus waived registration, value \$75).

The amount awarded depends upon need (e.g. distance travelled) and the nature of the contribution (poster versus spoken paper). The two students whose registration was waived came all the way from the Netherlands, and creditably managed to find sponsors to pay their air fares.

## 5. Treasurer's Report:

The Treasurer's report was presented by Peter Wilson (and is included at the end of this report).

A. Direct Debiting: George Scott proposed that the society consider Direct Debiting of bank accounts for payment of annual subscriptions. This would be easier for members, and would reduce the number of defaults due to memory lapses. Credit card options were suggested but thought to be too expensive. Peter Wilson will make enquiries.

B. FASTS: Mike Crisp outlined to the Meeting the functions of FASTS and noted that there was some dissatisfaction expressed at the last General Meeting about its performance. Recent upheavals in the administration of FASTS have further weakened its credibility. Given that it costs the society

\$1,353 per annum to belong to FASTS and that we have had a sizeable deficit in the last few years, the council recommended to the meeting that we withdraw from FASTS immediately. Further discussion ensued into the merits of belonging to FASTS or not. FASTS were clearly not succeeding in getting information through to the members of constant societies. It was pointed out that if a number of societies pulled out of FASTS the organisation might collapse, and that in times of economic hardship it is important to support a lobby group such as FASTS. Bigger societies have always dominated FASTS but it has, in the view of some members, increased the profile of science in Australia. Subscriptions could be further increased to cover the FASTS levy, perhaps with the amount going to FASTS clearly indicated on the subscription renewal form. There was some uncertainty over whether it is the processes or the personnel that were failing. The motion that we withdraw from FASTS immediately (moved Mike Crisp; seconded Barbara Wiecek) was passed by the Meeting (16 for, 12 against). Mike Crisp will notify FASTS.

Following the vote, it was stressed by the Meeting that ASBS would have to take a more active lobbying role itself, perhaps through groups such as the Australian Biodiversity Council.

C. Annual Subscription: It was proposed that the annual subscription for a Regular Member be raised to \$35, with the annual subscription for a Student Member remaining at \$15 (moved Peter Wilson; seconded Peter Weston). The motion was passed by the Meeting (1 against).

D. Acceptance of Treasurer's Report: The Meeting was asked to accept the Treasurer's report as a true statement of our financial accounts (moved Helen Hewson; seconded George Scott). Unanimously agreed to by the Meeting.

## 6. Newsletter Editors' Report:

The Newsletter Editors' report was presented by David Morrison.

Barbara Wiecek and I have continued to be the editor's of the Society's *Newsletter*. Six issues (num-

bers 74—79) have been produced since the last General Meeting, number 79 being posted last Thursday. These issues have all appeared more-or-less on time (i.e. in their due month) — each issue takes about two weeks to compile and format, one week to print, and about half a week to process and mail; so, delays in submitting material almost inevitably cause delays in the appearance of the *Newsletter*. The size of the issues has varied from 24 to 36 pages, with Society business actually occupying very little of the space. Issue 76 contained the membership list as at August 1993, while issue 79 contains a list of email addresses. An index to the *Newsletter* numbers 51—70 was also produced.

Contributions to the *Newsletter* are mostly voluntary, except for those from the Council members (who continue to insist on submitting their contributions as late as possible), and we would like to thank all of those people who have submitted contributions (especially Barry Conn, who is always a good source when an issue is looking a bit thin). There has been a notable increase in the number of submissions arriving in electronic format, either via email or on disk — this makes the job of producing the *Newsletter* easier, faster and cheaper (since re-typing of contributions costs money), so we would encourage all members to make their contributions in this way.

There are no written guidelines for the *Newsletter* editors, except for constraints on the length of individual contributions (which are often ignored by the editors) and a ban on contributions that make new taxonomic names or nomenclatural combinations (or formally synonymize existing ones). Furthermore, the editor's are not elected by the members of the Society, but are appointed by the Council. This means that the editors have an almost free hand in committing a large part of the Society's money without direct control by the membership, and this places particular pressure on the decisions that they make. It currently costs about \$1,500 to produce each issue of the *Newsletter*, and clearly any change in the size of the issues can have significant financial consequences for the Society. There are a number of ways in which the cost of the *Newsletter* could be reduced, should this become of concern to the Society:- (i) enforce a page limit for each issue or group of issues (the average size in recent years has grown

to 33 pages per issue); (ii) change the format size (as the current size requires trimming by the printer); (iii) stop producing the consolidated indexes (they are currently planned to be effectively an extra issue of the *Newsletter* every five years); (iv) stop David Morrison from writing book reviews (as these are the main reason for the increase in the size of recent issues).

Our resignation from the job of *Newsletter* editors dates from this meeting, having fallen just short of Gordon Guymmer's record stint as editor. Both Barbara and I have enjoyed most of our time in the job, and we are pleased that we have been able to contribute actively to the Society in this fashion.

Incoming *Newsletter* editors are Greg Leach and Clyde Dunlop.

**Discussion:** The meeting considered whether distributing the *Newsletter* via email was appropriate. David Morrison pointed out that illustrations were difficult to include in this form and that the print copy was well-liked. It was also noted that not all subscribers were connected to email.

John Clarkson proposed that we give a vote of thanks to the outgoing editors (seconded George Scott). Carried by acclamation.

## 7. Society Meetings:

**Perth 1993:** Jenny Chappill told the meeting that the publication of the proceedings was on track and that the meeting was a success both scientifically and financially.

**Kuranda 1994:** The Meeting thanked John Clarkson and his team for a well organized and interesting conference. John Clarkson noted that the proceedings would be published as groups of papers in scientific journals. This would save the society money and make the papers widely available. John also stressed the important role of sponsors in allowing the current conference to be kept within budget. The meeting made it clear that supporting conferences and workshops was a worthwhile and appropriate use of the society's finances.

**Canberra 1995:** Mike Crisp is organising a 5 day Workshop on "Analysis of Cladistic Data: Morphological and Molecular" to be held at the Australian National University, Canberra, 25—29 September 1995. Mike Crisp, David Morrison and a funded tutor will run the workshop. Notices were included in the last *ASBS Newsletter* (79: 8) and were available at the Kuranda conference. Due to laboratory constraints, the workshop will be limited to c. 40 participants. There was some discussion about whether other workshops could be held in conjunction with this one, particularly to ensure that a quorum was reached for the next General Meeting, to be held during that week. It was felt more appropriate that organisers ensure that a goodly proportion of ASBS members were present at the workshop. Mike Crisp was to consider the idea of parallel workshops.

**Melbourne 1996:** Tim Entwisle reported that the "1996 Commemorative Conference" — organised by the Royal Botanic Gardens Melbourne in conjunction with ASBS, the Royal Society of Victoria and the Mueller Correspondence Project — will be held 22—28 September 1996 at the University of Melbourne. It will consist of an historical and a systematic meeting, the latter entitled "Beyond the Floras". A brochure was included with the last *Newsletter* (79) and was made available at the Kuranda conference. The State Government of Victoria has provided substantial funding for international and local speakers, a number of speakers having already agreed to present plenary lectures. The proceedings of the scientific sessions will be published in a special issue of *Australian Systematic Botany* in 1997.

**Adelaide 1997:** Mike Crisp and John Conran reported that a conference with the tentative title of "Ecological Adaptation of the Australian Flora" will be held in Adelaide some time in 1997. Bill Barker is the contact for this conference.

**Sydney 1998:** Karen Wilson outlined a proposal that ASBS meet with the International Monocot Conference in Sydney during 1998. The Meeting supported the idea.

## 8. Australian Biodiversity Council:

Tim Entwisle summarized the outcome of a work-

shop held in Melbourne, 25—26 June 1994 to consider the establishment of an Australian Biodiversity Council. The proposed goals of such a Council would be to: advocate the scientifically-based conservation of biodiversity; inform Australians of the importance, values and benefits of biodiversity; promote the integration of scientific expertise into political, social and economic contexts; promote policies and mechanisms for the conservation of biodiversity; stimulate informed public discussion of biodiversity as part of decision-making processes; and promote multi-disciplinary forums for Australian scientists concerned with biodiversity. The council of c. 10 people would be selected by an assembly of about 100 people, including equal numbers of nominees of participating societies and of individual members. A secretariat would be maintained to service the council and assembly.

Tim Entwisle was impressed by the organisation of the workshop (largely by Margaret Blakers) and by the level of commitment expressed by all of the societies represented there. On behalf of the working group established from the workshop, Tim Entwisle asked the Meeting for "in-principle" support for the formation of an Australian Biodiversity Council and for any request for establishment funding to be considered by the ASBS council (moved Mike Crisp; seconded Julia Playford). Unanimously carried by the Meeting. Tim Entwisle agreed to represent the society during this formative stage.

## 9. Constitution:

Mike Crisp reported that the new constitution had been accepted by the membership and was now in force.

## 10. Other Business:

Judy West asked that the society write to the Commonwealth Minister for Environment, Sport and Territories to express our dissatisfaction with the current level of funding for the Australian Biological Resources Study.

Geoff Tracy urged that we write to the same Minister to show our support for the proposed

National Tropical Botanic Gardens at Mareeba.

Mike Crisp will write letters on behalf of the Society.

### 11. Council Elections:

On behalf of the Returning Officer, Mike Crisp notified the Meeting that the following people were elected to the Council:

Michael Crisp (President), Gordon Guymer

(Vice-President), Chris Puttock (Secretary), Peter Wilson (Treasurer), John Clarkson (Councillor) and Tim Entwisle (Councillor). The Public Officer remains Andrew Lyne.

Mike Crisp thanked the out-going Vice-President, Jenny Chappill, for her support.

Meeting closed: 7.40 pm

Tim Entwisle  
Acting Secretary, ASBS Inc.

---

### Treasurer's report for the financial year ended 31 December 1993

An audited summary of receipts and payments for the year ended 31 December 1993 accompanies this report.

#### Membership

At the end of 1993, the membership stood at 357. This was made up as follows:

Gratis members (most herbaria, ABLO, FASTS rep, etc.) ..	15
Institutional members (14 overseas + 5 Australian) .....	19
Student members (full-time students) .....	27
Ordinary members (13 overseas + 284 Australian) .....	297

#### Income

##### Subscriptions

Subscriptions remain the Society's major source of income. This amounted to \$8,122 for the period ending 31 December 1993. We received a return of \$500 from the Southern Connections conference (the Society made a contribution of \$2,500 towards speakers' fares). Late payment of subscriptions seems to be a perennial problem for treasurers. As of the end of June this year, there were still 101 unfinancial members, 17 of these being two years in arrears. All these members have been notified in writing, and I hope there will be little delay in the response. Late subscriptions also create extra work

for the *Newsletter* editors when back-issues have to be sent out.

#### ASBS Merchandise and Book Sales

Sales of ASBS merchandise have been much better in 1993, with \$889 in income having been received. I have already received some monies this year, so the good work is continuing. Book sales have been slow and Council will be considering ways to improve sales of the "History of Systematic Botany in Australasia" book. There has been a slow trickle of other book sales, and the Society can expect to get some further returns from the "Evolution of the Flora and Fauna of Arid Australia" book by the end of this year.

#### Expenditure

Our major item of expenditure is the *Newsletter*. In 1993, this cost us a total of \$6,245, about the same as in 1992 but this is still over 75% of our subscription income. In relation to this, it should be noted that the *Newsletter*'s "Registered Publication" agreement with Australia Post ran out in March and it now comes under "PrintPost". This will probably result in an increase in postage costs, but the extent of this is still unknown. Postage is, however, a relatively minor component of our *Newsletter*-related costs.

#### Our other main expenses are:-

1. Subscription to FASTS: this was \$1,353

(unchanged from 1992), a fairly substantial overhead.

2. Conference expenses: the Society contributed a float of \$1,000 to the SECWAB conference and \$450 in student awards at the same conference. For the Monsoon Tropics conference the Society has contributed a float of \$2,500. Conference sponsorship is a very important part of the role of the Society and should continue to be an area of support.

### Assets

A major component of the deficit shown by the Society is due to a restructuring of our non-monetary assets. Newsletters will no longer be shown as assets, being essentially ephemeral in content for the most part. Our only sale for 1993 was a single copy of number 53 (Boden Conference issue) and there is not likely to be much change in the future; it may even be desirable to rationalize our stocks. Merchandise items (mugs, T-shirts, etc.) are now recorded at cost (rather than expected retail). This change in method of recording will better reflect the Society's financial position.

### Financial position

Taking the above into account, the Society still had a deficit for the year of \$2,946. The Society's

cheque account balance has been falling steadily over the last few years:-

31.12.1990 .....	\$1,5489.44
31.12.1991 .....	\$2,0018.17
31.12.1992 .....	\$1,6677.78
31.12.1993 .....	\$1,0971.66

Note that this has been somewhat accentuated by Council's decision to apply the interest from term deposits to the Research Fund. Even this has been affected by the drop in interest rates.

To address this, the Society has only the two obvious options: increase income or decrease expenditure. The viable options for these are listed below, and should be considered by the membership.

#### To increase income:

- raise subscriptions
- increase number of members — many botanists are not members of ASBS, and keep up with the news through issues displayed in their institution's library
- increase sales of books and merchandise.

#### To cut expenditure:

- reduce the size of the Newsletter
- review membership of FASTS.

Peter Wilson

Honorary Treasurer, ASBS Inc.

## Auditor's report

### Scope

We have audited the following financial statements of the Australian Systematic Botany Society Inc. for the year ended 31 December 1993. The Society is responsible for the preparation and presentation of the information contained therein. We have conducted an independent audit of these statements in order to express an opinion on them to the members.

Our audit has been conducted in accordance with Australian Auditing Standards to provide reasonable assurance as to whether the statements are free of

material misstatement. Our procedures included examination, on a test basis, of evidence supporting the amounts and other disclosures in the financial statements, and the evaluation of accounting policies and significant accounting estimates. These procedures have been undertaken to form an opinion as to whether, in all material respects, the financial statements present fairly in accordance with the cash basis of accounting whereby revenue is recorded when it is received, and expenses are recorded when they are paid. Statements of Accounting Concepts and Accounting Standards are not applicable to the cash basis of accounting adopted by the Society.

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

**Qualification**

As is common for organisations of this type, it is not practicable for the Society to maintain an effective system of internal control over donations, subscriptions and stock until their initial entry in the accounting records. Accordingly, our audit in relation to these activities was limited to amounts recorded.

to be necessary had the limitation discussed in the qualification paragraph not existed, the financial report presents fairly in accordance with the cash basis accounting, as described above, the payments and receipts of the Society for the year ended 31 December 1993.

**Qualified Audit Opinion**

In our opinion, subject to the effects of such adjustments, if any, as might have been determined

30 June, 1994  
 Maxwell R Pegler  
 M.R. Pegler & Co  
 201/174 Cathedral Street  
 Woolloomooloo NSW 2011

**FINANCIAL STATEMENT**

**Australian Systematic Botany Society Inc.  
 Receipts and Payments Statement for the Year Ended 31st December 1993**

31ST DECEMBER, 1992

31ST DECEMBER 1993

**RECEIPTS**

522.....	Donation to Research Fund .....	329
	<b>Interest received</b>	
655.....	- Cheque account .....	363
902.....	- Term Deposit .....	668
38.....	- Research Account .....	109
	<b>Sales</b>	
934.....	- History Book Sales .....	481
25.....	- Arid Zone Symposium .....	0
15.....	- Merchandise incl. Newsletter .....	889
6,750.....	Subscriptions to ASBS Inc .....	8,122
2,851.....	Subscription CSIRO journals .....	1,525
0.....	Repayment Sthrn Conn. Conference .....	500
0.....	Donation Monsoon Conference .....	100
981.....	Workshop .....	0
0.....	Sundry Income .....	50
<b>13,673.....</b>	<b>TOTAL RECEIPTS .....</b>	<b>13,136</b>

**PAYMENTS**

150.....	Artwork .....	0
660.....	Auditors remuneration .....	533
23.....	Bank charges .....	28

3,390	Conference Expenses	4,740
36	Filing fees	25
60	General expenses	0
7,233	Newsletter Expenses	6,245
779	Postage	171
0	Provision for Stock Writedown	3,714
310	Publications	0
	<b>Returns</b>	
607	- Maude Gibson Trust	0
485	- WR & RM Barker	0
837	- P Short	0
10	Search fees	0
68	Stationery	0
3,118	Subscriptions	4,338
339	Travel and accommodation	0
116	Typing	0
<b>18,220</b>	<b>TOTAL PAYMENTS</b>	<b>19,794</b>
<b>(4,548)</b>	<b>NET SURPLUS (DEFICIT)</b>	<b>(6,660)</b>

**Australian Systematic Botany Society Inc.  
Balance Sheet as at 31st December 1993**

31ST DECEMBER, 1992

31ST DECEMBER 1993

<b>(4,548)</b>	<b>NET SURPLUS ( DEFICIT )</b>	<b>(6,660)</b>
	Retained surpluses or (accumulated deficits) at the beginning of the year	
44,787		40,239
40,239	<b>TOTAL MEMBERS' EQUITY</b>	<b>33,579</b>

**CURRENT ASSETS**

	<b>Cash</b>	
14,178	- Bank a/c - cheque	9,574
2,851	- Bank a/c - research fund	4,510
10,000	Term Deposit	10,000
1,400	Term Deposit	1,400
	<b>Inventories</b>	
1,537	- Society Newsletters	0
4,778	- T-shirts, sweatshirts, mugs	2,556
349	- Books - Evolution F & F	252
5,147	- Books - Systematic Botany	4,986
40,239		33,579
<b>40,239</b>	<b>NET ASSETS</b>	<b>33,579</b>

# SUBSCRIPTIONS

## Subscriptions to ASBS for 1995

Subscriptions for 1995 were increased at the recent Annual General Meeting. Subscription rates for 1995 will be:

- Ordinary/Institutional Members.....\$35
- Full-time students.....\$15

Subscription become due on 1 January, 1995; a membership renewal form will be included in the December issue.

CSIRO Scientific Journals  
1995 Concessional Price List

The concessional rates for subscriptions to CSIRO journals for 1995 are listed below. Note that these

are available only to *financial members* of A.S.B.S. Subscriptions must be paid for through the Society — the concessional rates are not available directly from CSIRO. Please note that *late orders will not be accepted*.

Those members wishing to subscribe, or renew their subscriptions, should send the appropriate subscription money by *January 6, 1995* to:

Dr P.G. Wilson  
Treasurer, ASBS Inc.  
National Herbarium of New South Wales  
Royal Botanic Gardens  
Sydney NSW 2000

Please include this with the payment of your 1995 subscription to the Society.

Journal	Concession	Full Rate
Aust. Journal of Agricultural Research .....	\$125 .....	\$250
Aust. Journal of Botany .....	\$110 .....	\$220
Aust. Journal of Chemistry .....	\$240 .....	\$480
Aust. Journal of Experimental Agriculture .....	\$110 .....	\$220
Aust. Journal of Marine & Freshwater Res. ....	\$125 .....	\$250
Aust. Journal of Physics.....	\$145 .....	\$290
Aust. Journal of Plant Physiology.....	\$115 .....	\$230
Aust. Journal of Soil Research.....	\$115 .....	\$230
Aust. Journal of Zoology .....	\$110 .....	\$220
Australian Systematic Botany.....	\$115 .....	\$230
Invertebrate Taxonomy .....	\$140 .....	\$280
Reproduction, Fertility & Development .....	\$115 .....	\$210
Wildlife Research.....	\$110 .....	\$220

## A.S.B.S. PUBLICATIONS

### History of Systematic Botany in Australia

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

Members \$30; non-members \$50. Postage \$10.

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, Wilhelm).

### 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 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:**

Kathy Mallett  
A.S.B.S. Sales  
Flora section, ABRS  
G.P.O. Box 636  
CANBERRA. A.C.T. 2601  
AUSTRALIA

# A.S.B.S. INC. MEMBERSHIP APPLICATION

**AUSTRALIAN SYSTEMATIC BOTANY SOCIETY INCORPORATED**  
(incorporated under the Associations Incorporation Act 1991)

## APPLICATION FOR MEMBERSHIP

I, .....

of .....

.....  
(address)

.....  
(occupation)

herby apply to become a member of the abovenamed incorporated association. In the event of my admission as a member, I agree to be bound by the rules of the Society for the time being in force.

.....  
(signature of applicant)

.....  
(date)

I, .....  
(full name)

a member of the Society, nominate the applicant for membership of the Society.

.....  
(signature of proposer)

.....  
(date)

I, .....  
(full name)

a member of the Society, second the nomination of the applicant for membership of the Society.

.....  
(signature of seconder)

.....  
(date)

Return this form, with the appropriate subscription, to the honorary treasurer:-

Dr. P.G. Wilson

National Herbarium of Nwe South Wales

Mrs. Macquaries Road

SYDNEY. NSW. 2000

## A.S.B.S. CHAPTER CONVENERS

**Adelaide**

Molly Whalen  
School of Biological Sciences  
Flinders University of South Australia  
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Tel: (08) 201-2723

**Darwin**

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Darwin Herbarium  
Conservation Commission of the NT  
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**Armidale**

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**Melbourne**

Tim Entwisle  
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**Canberra**

Carolyn Weiller  
Research School of Biological Sciences  
Australian National University  
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Tel: (06) 249-4841

**Sydney**

Barry Conn  
National Herbarium of New South Wales  
Mrs. Macquaries Road  
SYDNEY NSW 2000  
Tel: (02) 231-8131

### Telephone and Fax Numbers for Major Australian Herbaria

International dialing sequence from outside Australia:-  
add the Australian country code 61 and omit the leading zero of the area code.

<b>AD</b> Ph: (08) 228 2311 Fax: (08) 223 1809	<b>BRI</b> Ph: (07) 877 9325 Fax: (07) 371 6655	<b>HO</b> Ph: (002) 202 635 Fax: (002) 207 865	<b>MBA</b> Ph: (070) 921 555 Fax: (070) 923 593
<b>CANB</b> Ph: (06) 246 5113 Fax: (06) 246 5249	<b>CBG</b> Ph: (06) 250 9450 Fax: (06) 250 9599	<b>MEL</b> Ph: (03) 655 2300 Fax: (03) 655 2350	<b>NSW</b> Ph: (02) 231 8111 Fax: (02) 251 7231
<b>DNA</b> Ph: (089) 894 516 Fax: (089) 323 849	<b>FRI</b> Ph: (06) 281 8211 Fax: (06) 281 8312	<b>PERTH</b> Ph: (09) 334 0500 Fax: (09) 334 0515	<b>QRS</b> Ph: (070) 911 755 Fax: (070) 913 245

This list will be kept up to date, and will be published in each issue.  
Please inform us 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 apply for membership by filling in an "Membership Application" form and forwarding it, with the appropriate subscription, to the treasurer. Subscription 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 of ASCII file on an MS-DOS or Macintosh diskette, accompanied by a printed copy; as an unformatted word-processor ASCII email file, accompanied by a fax message reporting the sending of the file; or as two typed copies with double-spacing if less than one page.

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 \$30 (Aust); full-time students \$15. 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 of 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.

## Incoming Editors

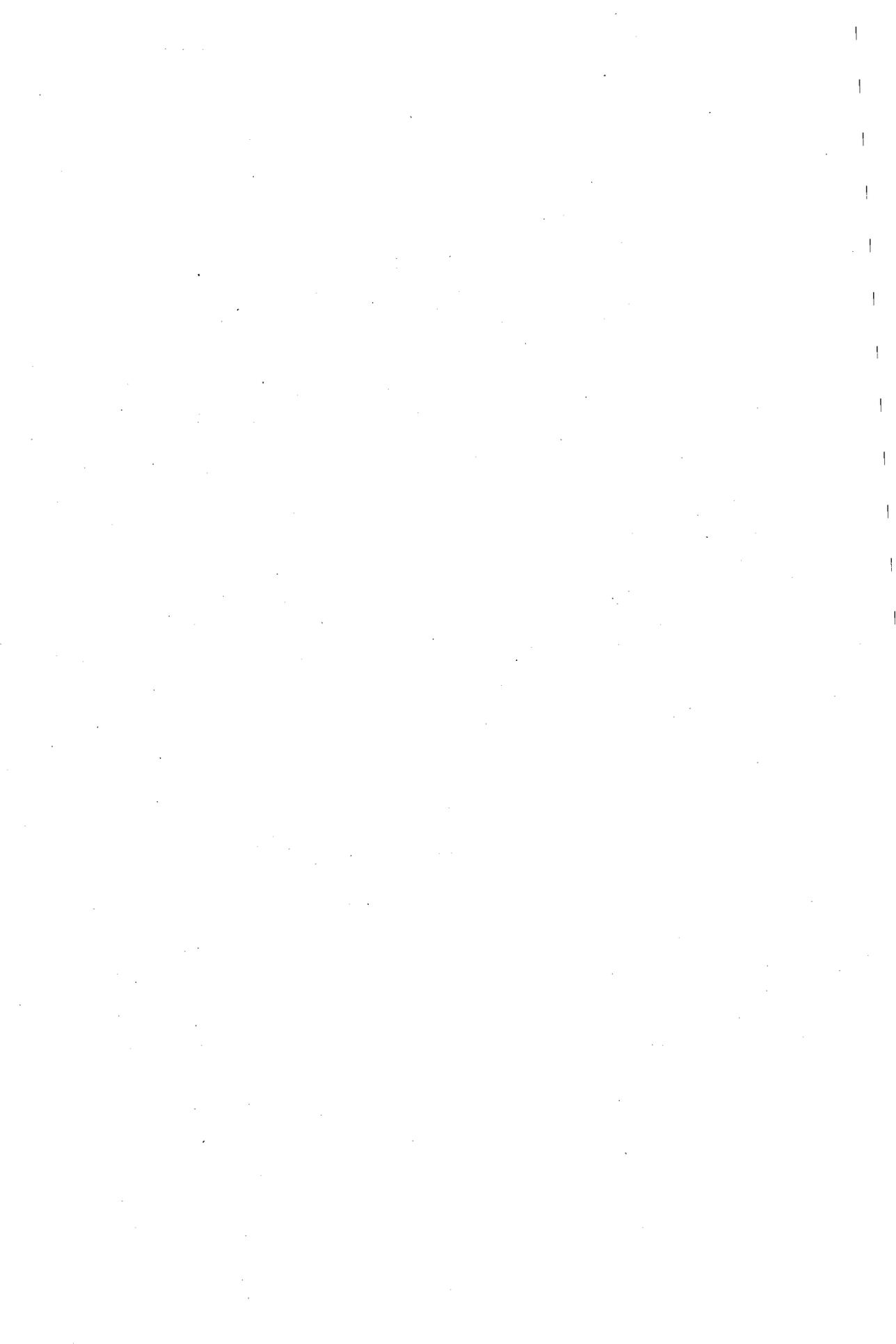
Mr. C.R. Dunlop ..... (089) 894512  
Dr. G.J. Leach ..... (089) 894514  
Email ..... leach.greg@ccpl01.a1.nt.gov.au  
Mr. I.D. Cowie ..... (089) 894511

## Postal Address

N.T. Herbarium  
Conservation Commission of the N.T.  
P.O. Box 496  
PALMERSTON NT 0831

## Cover

David Mackay





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