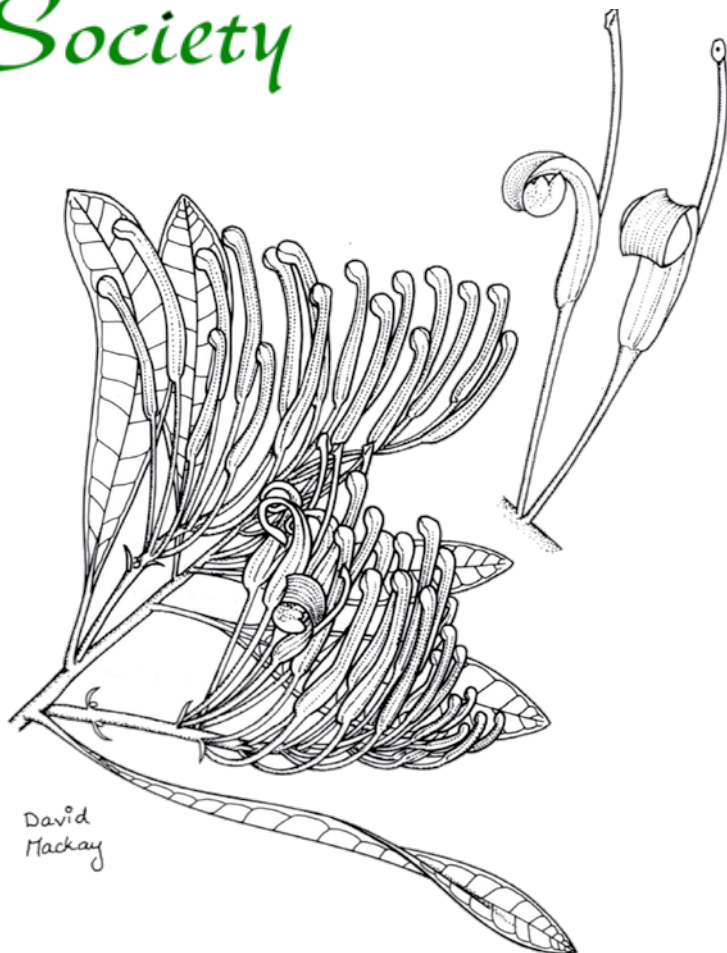


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From the President

I guess most members have emerged from their summer breaks and got back into the swing of their botanical work by now. 2010 was barely upon me when I had to resume preparing for my trip to South America for the VI Southern Connection Congress in Bariloche, Argentina and for associated fieldwork and a herbarium visit. The conference was a great success, partly due to the impressive level of participation by Australian botanists, who presented a number of excellent talks, including a fascinating plenary lecture by Richard Hobbs, entitled "Invasive species and global change: novel ecosystems and their implications for conservation and restoration". After the conference I paid a brief visit to the Museo de la Plata, just south of Buenos Aires to meet with Jorge Crisci's research group and to use their herbarium. I was mightily impressed by the high quality of their work and of their museum, which operates using fewer resources than any comparable institution in our country. The group of Australians with whom I travelled in Chile and Argentina were fortunate to organise our field work before the conference, because 8 days after it finished the fifth worst earthquake on record struck central Chile. Having driven down the main street of Concepcion only three weeks before the quake, we felt great sympathy for the victims and felt that we were lucky not to be among them.

Being busy with overseas travel has kept my mind off ASBS business for longer than I would like, so lately I have been catching up with some of the projects and problems with which ASBS Council

must deal in 2010. First of these is to announce the completion of a project that was initiated by former ASBS President, Marco Duretto: a new ASBS web site. Last year, Marco and Kirsten Cowley commissioned Siobhan Duffy, a graphic designer from the Visual Resources Unit of CSIRO Plant Industry to redesign the Society's website and the results should be "live" by the time this *Newsletter* is published. Present and past Council members are very pleased with the result, which is not only a lot more attractive to look at than the previous version but is also easier to use and more informative. Our hearty thanks go to Siobhan for her excellent work and patience and to Murray Fagg for his continuing work as webmaster.

Quality assurance of the results of environmental consultants and accreditation of providers of biological identification were raised as significant problems at our Armidale conference. I wrote in my previous column that we would be encouraging further discussion and debate of these issues in the *Newsletter* this year. Jeremy Bruhl kicks this off with an article in this Newsletter announcing the development of a wiki online discussion site devoted to the subject of accreditation and quality assurance in biological identification. Please have a look at the site and contribute your opinions. This is an important subject that needs to be discussed by people who know what they are talking about. It therefore needs the active involvement of ASBS members.

Peter Weston

From the Editors

Gael Campbell-Young has recently received news that she will be moving to the West earlier than planned. Implications for the *Newsletter* are the need to find one or more members of the Society who can take on her editorial responsibilities for the next issue and onwards.

CALL FOR INTEREST IN *NEWSLETTER*
PROOFING, BOOK REVIEWS AND
DISTRIBUTION MANAGEMENT

Please contact Russell Barrett if you would be willing to take on any or all of the above tasks to ensure the smooth production of the *Newsletter*. On behalf of the members, we thank Gael for her professional and timely support to the production of the last six issues.

RB would like to apologise for the lateness of this issue, largely due to an unfortunately timed computer failure just prior to travel commitments, combined with attempting to write a Ph.D...

GCY would like to specially thank RB for his sustained hard work in producing the *Newsletter* on behalf of the Society. Book reviewers are also thanked for their timely and quality contributions of reviews to the *Newsletter* and their constantly

cheerful willingness to provide reviews. I have thoroughly enjoyed participating in the production of the *Newsletter* and look forward to keeping up with all things taxonomic in the future.

Articles

The discovery and documentation of the eucalypts of Queensland and New South Wales, 1896–1961

A.R. Bean
Queensland Herbarium

In a previous article (Bean 2005), eucalypts were discussed for the time period 1770 to 1895. By the end of 1895, 68 of today's accepted Queensland species had been named, and 80 species from New South Wales. 1896 saw the end of the Muellierian era, and the rise of new taxonomists in the study of eucalypts. For the next three decades, eucalypt taxonomy was to be dominated by Joseph Maiden and Richard Baker, both based in Sydney.

Maiden migrated to Australia in early 1881, and soon became a keen student of the Australian flora, especially the wattles and "gum-trees". In learning about the profligate genus *Eucalyptus*, he naturally fell back on Bentham's "*Flora Australiensis*" and Mueller's "*Eucalyptographia*". He corresponded with the Baron on many occasions and sent him specimens for identification, but as Maiden's knowledge of the genus increased, aided by his mentors Henry Deane and William Woolls, he found some of Mueller's identifications to be "indefensible" (Gilbert 2001).

Maiden became arguably the greatest ever eucalyptologist. He studied the minute details of every part of the plant. He was perhaps the first to realise the importance of the juvenile or "primary" leaves in the taxonomy and classification of eucalypts, though he graciously acknowledged Alfred Howitt as the first to publish on their diagnostic importance. His "*Critical Revision of the genus Eucalyptus*" is a classic and many of the observations therein have stood the test of time. Maiden had a keen interest in the history of botany and the botanists who contributed knowledge of

the Australian flora, and this is strongly reflected by the epithets of the species he named. No fewer than 27 of his accepted eucalypt species names from NSW or Qld commemorate botanists, including *E. banksii* and *E. benthamii*.

Richard T. Baker was Maiden's assistant until 1896, when Maiden became Director of the Botanic Gardens in Sydney, and Baker succeeded him as the head of the Technological Museum. Baker's personality was described by Penfold (1941) as "energetic, fiery and dominating". He was an economic botanist and chemist, and his studies in *Eucalyptus* taxonomy drew heavily on analyses of oils and other compounds distilled from the leaves and bark of the various trees. Baker believed that eucalypt species "show, comparatively, not much variation, in fact, possess such a constancy of specific characters that is surprising in the light of previous published literature on the Eucalypts" and that "the Eucalypts may be regarded as fairly invariable" (Baker & Smith 1920). This was the core of a theory that he called the "constancy of species".

Maiden and Baker profoundly disagreed in their approach to taxonomy and species concept, and a long-standing professional conflict soon arose. After 1896, the personal relationship between the two was apparently largely confined to official letters posted between their offices.

In his publications, Maiden frequently remarked on the large amount of morphological variation in many species of eucalypt in different parts of their range. Maiden had a broader species concept than that prevailing today, and inevitably he placed some of Baker's species into synonymy, displeasing the latter immensely. Baker, in Baker & Smith (1920), said "The reputed or supposed great variation of individual *Eucalyptus* species has arisen probably by the attempts of botanists to found species on morphological characters

alone”, and that “too much reliance had been placed on herbarium specimens” in the defining of species. These statements denigrate Maiden’s concepts and techniques while defending his own, but unintentionally, they also fly in the face of Baker’s “constancy of species” theory.

Maiden in turn (Maiden 1922) criticised Baker (and Smith, his assistant and co-author) for their over-reliance on chemical properties in defining species. He refuted Baker’s theory on the “constancy of species” and also the claim by Baker and Smith that there is a correlation between the angle of the secondary veins in eucalypt leaves and the chemical constituents of the oils in those leaves.

Maiden maintained that careful examination of the morphology would lead to the best definition of species, while Baker advocated a strong emphasis on chemical properties in species circumscription. History has largely proven Maiden correct: Maiden authored or co-authored 68 NSW and Qld eucalypt names at species rank, of which 55 (81%) are accepted today (excluding hybrids); Baker authored or co-authored 42 NSW and Qld eucalypt names at species rank, of which 23 (55%) are accepted today (excluding hybrids).

While Maiden undoubtedly found the conflict with Baker deeply upsetting, Baker himself enjoyed the controversy his theories provoked, and wrote in a letter “I didn’t mind the opposition for I love a fight” (Willis 1979). To his credit, Maiden did not allow professional disagreement to spill over into personal dislike. In 1913, he named *Eucalyptus bakeri*, as a tribute to his colleague’s achievements.

Maiden’s assistant in eucalypt study from 1913 was William Blakely, and after Maiden’s death in 1925, it fell to Blakely to continue his work and to publish his manuscripts. Maiden’s “Critical Revision” is a very valuable work but also a rambling work, spread over eight volumes and almost thirty years. There was a great need for a single publication for the identification of eucalypts.

Blakely resolved to publish such a book, which he did in 1934, modestly entitled “A Key to the Eucalypts”. Blakely decided to classify the eucalypt species according to their anthers. Anther

morphology had been used to good effect by Bentham to separate major groups in *Eucalyptus*, but Blakely utilised this character to the extreme. The first part of the book comprises a dichotomous key to many sections and subsections, based solely on anther morphology. His faith in the anthers as a panacea for identifying and classifying eucalypts was not warranted for several reasons; the anthers are very small and only those possessing a microscope could hope to make the necessary observations; variation in the anthers within a species makes it very difficult for a user to key to the correct subsection; and the key was unusable if the specimen lacked flowers or mature buds. Furthermore, it was soon recognised that his anther classification grouped some unrelated species and separated sibling species, so that his approach lost favour altogether. Nevertheless, the book became the standard eucalypt reference for many years. The main value of the book was that it provided, for every species then known, a comprehensive description, some localities based on herbarium records, uses or potential uses, habitat information and flowering times.

Many of the new species that Blakely published are not accepted today. Some of his enduring species are those that were brought to his attention by colleagues such as E.N. McKie, T. Youman, and C.T. White, who had had the opportunity to see the species in the wild. After publication of his “Key”, Blakely named only one further species from NSW or Qld, *E. michaeliana*, in 1938.

The topic of hybrids is particularly relevant for the time period under discussion. We know now that hybridization between eucalypt species is common, especially amongst the section *Adnataria* (Boxes and Ironbarks). It is inevitable that over the years numerous hybrids have been accidentally named as species because 1. hybrids are over-represented in herbaria – it is human nature to be drawn to the unusual, and many collectors will happily pass by a thousand trees of a species to collect a specimen from the one hybrid tree in the region; 2. it is often very difficult for a herbarium botanist to determine anomalous specimens as hybrids, unless detailed notes are provided by the collector about bark type and extent, associated eucalypt species, and the number of trees that match the specimen. Notes of this quality are rarely present.

The existence of hybrids in *Eucalyptus* was first discovered by George Caley around 1805 (Webb 1995). Mueller vehemently believed that hybridization in eucalypts was impossible, because he maintained that “cross-fertilisation is guarded against by a calycine lid” (Mueller 1880). Maiden for many years was unsure whether eucalypt species could hybridize, but by about 1904 he became convinced of the existence of hybrids. During his career, Maiden named several hybrids “accidentally”, *i.e.* he believed them to be species at the time he named them. However in 1913, he deliberately named a taxon that he knew to be a hybrid, saying, “this is the first species of the genus which has been named with especial reference to its hybrid character” (Maiden 1920). He gave it the uninspiring name of *Eucalyptus hybrida*, and added, “I have a large number of instances of apparently indubitable hybrids ... and I propose to describe them”. Describe them he did in Volume 6 of his ‘Critical Revision’, saying that he had “no choice between naming them like ordinary species, or continuing to refer to them by circumlocution”.

Blakely enthusiastically followed his lead, and he formally named several more hybrids in his ‘Key to Eucalypts’ and in other publications. The formal naming of eucalypt hybrids is rarely practised these days, which is a good thing, because it would be quite possible for the number of hybrid epithets to exceed the number of species epithets. To my knowledge, the only epithets given to a known hybrid in the last twenty years are *E. × stoataptera* E.M. Benn. (Bennett 1995) and *E. × missilis* Brooker & Hopper (Brooker & Hopper 2002).

Eucalypt taxonomy understandably subsided during World War II, and the quiet times continued into the 1960s. In the post-war period, A.K. Cameron described one new species of eucalypt (*E. chapmaniana*) and wrote some papers on the nomenclature of eucalypts, including one that attempted to determine the correct names for species described by Antonio Cavanilles.

S.T. Blake’s publication of a major paper on the eucalypts of northern Australia (Blake 1953) was a highlight. In this paper Blake made some very important observations about the life

history of tropical eucalypts, their taxonomy and nomenclature, and included useful photographs of trees and herbarium specimens. Blake’s taxonomic concept was very broad, so that he combined many species that had previously been recognised. He named only one new species (*E. porrecta*) in that paper, and raised another (*E. gilbertensis*) to species rank.

I have chosen 1961 as the end date for this account. In the following year, L.A.S. Johnson published his first eucalypt paper, and was set to continue the dominance of Sydney-based botanists in eucalypt taxonomy. He and Lindsay Pryor (from Canberra) started a resurgence of interest in eucalypt taxonomy and classification.

The following tables (Tables 1, 2) summarize the sequence of formal naming of the currently accepted eucalypt species in both Queensland New South Wales over the period from 1896 to 1961. Maiden is the author or co-author of 51% of Queensland species listed, and 53% of New South Wales species listed.

Table 1. Queensland Eucalypts [List includes *Eucalyptus*, *Corymbia* and *Angophora*, but only those taxa described at species level and currently accepted at species level, and known to be indigenous to Queensland. The full basionym is listed if not *Eucalyptus*].

Year	Species added in that year	Progressive total
1896	<i>propinqua</i>	69
1898	<i>bridgesiana</i> , <i>laevopinea</i>	71
1899	<i>camphora</i> , <i>quadrangulata</i>	73
1900	<i>Angophora melanoxydon</i> , <i>conica</i> , <i>intertexta</i> , <i>nova-anglica</i> , <i>oreades</i> , <i>viridis</i> , <i>woollisiana</i>	80
1901	<i>intermedia</i>	81
1904	<i>andrewsii</i> , <i>deanei</i> , <i>seeana</i>	84
1905	<i>banksii</i> , <i>dunnii</i> , <i>scoparia</i>	87
1906	<i>caleyi</i> , <i>carnea</i> , <i>leichhardtii</i> , <i>thozetiana</i>	91
1912	<i>campanulata</i>	92
1913	<i>bakeri</i> , <i>brownii</i> , <i>cambageana</i> , <i>similis</i>	96
1917	<i>bancroftii</i> , <i>blakelyi</i>	98
1919	<i>normantonensis</i>	99
1920	<i>cullenii</i> , <i>dabrympleana</i> , <i>notabilis</i>	102
1921	<i>decorticans</i>	103

1923	<i>herbertiana, microcarpa, shirleyi</i>	106
1925	<i>bloxsomei, microneura, whitei</i>	109
1927	<i>globoidea</i>	110
1928	<i>orgadophila</i>	111
1929	<i>conglomerata, pachycalyx, tindaliae</i>	114
1930	<i>codonocarpa, mckieana, youmanii</i>	117
1931	<i>curtisii, tenuipes</i>	119
1934	<i>argophloia, caliginosa, erythrophloia, major, nesophila</i>	124
1938	<i>michaeliana</i>	125
1953	<i>gilbertensis</i>	126
1958	<i>panda</i>	127

1922	<i>agglomerata</i>	136
1923	<i>microcarpa, rummeryi</i>	138
1924	<i>badjensis</i>	139
1927	<i>globoidea, multicaulis</i>	141
1929	<i>glaucescens, nicholii, pachycalyx, tindaliae</i>	145
1930	<i>codonocarpa, mckieana, youmanii</i>	148
1934	<i>caliginosa, cameronii, cephalocarpa, largeana, malacoxylon, sparsifolia, triflora</i>	155
1938	<i>michaeliana</i>	156
1947	<i>chapmaniana</i>	157
1958	<i>panda</i>	158

Table 2 . New South Wales Eucalypts [List includes *Eucalyptus*, *Corymbia* and *Angophora*, but only those taxa described at species level and currently accepted at species level, and known to be indigenous to New South Wales. The full basionym is listed if not *Eucalyptus*]

Year	Species added in that year	Progressive total
1896	<i>propinqua</i>	81
1898	<i>bridgesiana, fraxinoides, laevopinea, squamosa</i>	85
1899	<i>acaciiformis, camphora, dawsonii, macarthurii, quadrangulata, rubida</i>	91
1900	<i>Angophora melanoxyton, aggregata, conica, delegatensis, intertexta, morrisii, nova-anglica, oreades, viridis, woollsiana</i>	101
1901	<i>angophoroides, intermedia, polybractea, umbra</i>	105
1902	<i>apiculata</i>	106
1904	<i>andrewsii, consideniana, deanei, rudderi, seeana</i>	111
1905	<i>banksii, dunnii, moorei, scoparia</i>	115
1906	<i>caleyi, carnea</i>	117
1912	<i>campanulata, gillii</i>	119
1913	<i>Angophora bakeri, bakeri, nitens, parramattensis</i>	123
1915	<i>benthamii, dwyeri, kybeanensis</i>	126
1917	<i>bancroftii, blakelyi</i>	128
1919	<i>approximans, blaxlandii, pumila</i>	131
1920	<i>camfieldii, canaliculata, dalrympleana, notabilis</i>	135

Acknowledgements

I am grateful to Karen Wilson and John Neldner for reviewing the manuscript.

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Grosvenor Selk—Kings Park Herbarium Curator and Volunteer

Greg Keighery

Department of Environment & Conservation,
WA

For some of my time working as the Research Botanist at Kings Park (1974–84) I worked alongside a delightful gentleman called Grosvenor Selk. However both Alex George (2009) and Dorothy Erickson (2009) do not mention Grosvenor. As a consequence I have prepared this note to introduce botanists to Grosvenor Selk who seems to have slipped out of memory and, unfortunately, from recognition.

The primary sources of this information are the Minutes of Kings Park Board from 1966 to 1976, the Annual Reports of the Department of Lands and Surveys and the specimens and notebooks details made by Grosvenor in the Kings Park and Botanic Gardens Herbarium (KPBG).

I continue to seek information about Grosvenor before and after his association with Kings Park. This is proving slow work and I would appreciate any further information and/or corrections of this introduction to Grosvenor Selk.

KPBG and Curators

The KPBG was established in 1963, soon after John Beard commenced as Director of the new State Botanic Gardens. Pauline Fairall (nee Bond and as in Goldblatt & Bond 1984) was the first Honorary Curator. Pauline's association with the Park was through the appointment of her husband, Arthur Fairall as Park Superintendent in June 1962. At the time Charles Gardner was the Park's Honorary Botanist until the Park was allowed to employ the first Research Botanist, Les Bousefield, in 1967. Pauline continued as honorary and/or an employed part-time curator/botanist until 1973. After Arthur Fairall died she returned to live and work in South Africa until 1984. Pauline returned to Perth in 1984 and again curated the Herbarium from 1995 to 2003.

The curators of KPBG (modified from George, 2009 page 65) were as listed below. Anne Coates (now Anne Ric), Chris Robinson and Eleanor Bennett were employed as display botanists and

their duties included labelling garden plants, guiding and identifying the Park living collections, seed collectors' vouchers and Wildflower Show plants.

Pauline Fairall	1963 to ?1966
Grosvenor Selk	?1966 to 1976
Anne Coates	1977 to 1980
Chris Robinson	1980 to 1984
Eleanor Bennett	1984 to 1995
Pauline Fairall	1995 to 2003
Eng Pin Tay	2004 to present day

Grosvenor Selk's Role and Contribution

I have trolled the Minutes of Kings Park Board from 1966 to 1976 and the Annual reports of the Department of Lands and Surveys to ascertain when Grosvenor was officially appointed, with little success.

Grosvenor's accession books (held at KPBG) commence in 1966, and I assume he commenced then in an honorary capacity. However, in 1970, the Director recommended that Grosvenor be paid \$1.50 per hour for his work in the Herbarium (Minutes 12 May 1970). In 1972 Pauline Fairall asked for a review of the hours and rates of pay of the part time botanists and it was agreed that Grosvenor would receive \$1.75/hour for a maximum of 24 hours per week and Pauline \$2.75 for a maximum of 20 hours per week (Minutes June 1972). Both were employed as casual labour, which probably accounts for the lack of records. In 1976 the board voted to increase Grosvenor's guide fees conducted outside working hours to \$4.00 per hour!

When Grosvenor resigned on 30/9/1976, because of his wife's illness, it was noted that he was "Part-time botanist in charge of herbarium, trained by Mrs P. Fairall, undertakes identifications and liases with State Herbarium and acts as a guide" (Kings Park Board Minutes, October, 1976).

It is assumed that Grosvenor retired from his paid role as he continued his association with the Park, both as a Kings Park Guide and in 1978 he prepared an index to the Herbarium collections.

Grosvenor also worked outside the Herbarium as he re-labelled all plants along the nature

trail, checked labels for most trees and new plantings and lead bushwalks during spring. He also made collections (see below), co-ordinated identifications of the labelled specimens for the Annual Wildflower Show with botanists from the State Herbarium and prepared an herbarium display for the show.

Grosvenor Selk's Herbarium Curation and Collections

When Grosvenor left the Kings Park Herbarium, he noted in the Annual Report of 1977 that it contained 18,316 mounted specimens. These included the following sets of plant specimens: 16,263 native Western Australia, 14 exotic trees, 374 horticultural exotics, 264 Kings Park Arboretum, 302 Kings Park bushland (natives and weeds) and from the gardens—170 Californian, 166 Mediterranean, 381 South African and 308 Eastern Australian species.

The Western Australian native collections include vouchers from John Beard's vegetation mapping work and seed collecting vouchers made by Lesley Fell, Fred Lullfitz and Herbert Demarz. These were often collected as duplicates or triplicates, and as KPBG was essentially a reference collection, commonly collected and duplicated material was sent elsewhere. One set was routinely sent to PERTH, while others were sent as duplicates to various Herbaria. As an example, in 1969/1970 3,263 mounted collections were added to KPBG and numerous triplicates sent to Rancho Santa Anna, Los Angeles County Arboretum, Missouri Botanic Gardens and Arnold Arboretum in North America. In 1970/71 all Western Australian species had locality maps prepared by Pauline and Grosvenor to be used to allocate species to phytogeographic regions for the Descriptive Catalogue under preparation. Chris Robinson dispatched the last of a large series of John Beard's triplicates to CANB on request from Dr Eichler.

Kings Park Herbarium is only about 20% data-based, and it is currently impossible to easily compare PERTH and KPBG, however, there are a large series of specialist unicate collections in the latter. These include the exotic or Botanic garden cultivated collections, many vouchers for the bushland surveys, specialist seedling collections and doubtless other miscellaneous material.

Seventy five collections of Grosvenor's are held in PERTH, but his collection numbers range up to 2,982, from 1966–1978. Grosvenor's herbarium accession books are held at KPBG and record his first collection as *Melochia pyramidata* made on 10 April 1966 from The Nursery at Kings Park and his final collections were from the gardens at Hollywood Village Retirement Centre on 30 June 1979. During this period Grosvenor collected mainly from the gardens and bushland of Kings Park to enable plants grown in the Botanic Garden to be identified and labelled. However, he also collected at Boya (1967), Mandurah (1967, 1971, 1972), Safety Bay (1968) and Bushmead (1967, 1968).

In 1972 Paul Wycherley as the new director of Kings Park wanted, as part of the research and development program for Kings Park to have a checklist of all plants, both cultivated and wild in the Bushland prepared to aid management and acquisition. It was noted by the Board that both Pauline and Grosvenor were collecting and undertaking identifications and would prepare the checklist. To accurately identify the plants Grosvenor made extensive collections in the arboretum (over 150 collections in 1971), gardens (451 collections in 1975) and bushland and nursery. He also made collections from material identified at the Wildflower Show (over 500 collections in 1974, 151 in 1975) to add material not represented in KPBG to the Western Australian material.

The available data-based list contains 349 of Grosvenor's collections. Probably the most significant of these collections not represented elsewhere will be his collections of Kings Park natives and vouchers of early weed records. For example, *Allocasuarina campestris* (Selk 1887), *Eremaea fimbriata* (Selk 1888) and *Beaufortia elegans* (Selk 1889) were collected in 1972 and noted as established in the bushland from broadcast seed. I was aware that non-local seed of *Anigozanthos manglesii*, *Acacia pulchella* *Eucalyptus gomphocephala* and other naturally occurring species were broadcast after fire into the bushland to enhance flowering displays and regeneration in the 1980's, leading to current provenance issues in Kings Park. However, I was unaware that this practise was so long-standing and extended to non-native species.

Other significant weed records present only in KPBG are collections of *Eucalyptus megacornuta* (Selk 493), collected in the Arboretum on 7 May 1972, this had become a major weed by the 1990's. There are also early records of *Acacia lasiocalyx* (Selk 2266, 1973), *Eucalyptus citriodora* (Selk 683, 9 April 1969), *Acacia microbotrya* (Selk 2357, 11 April 1973) *Brachychiton populneus* (Selk 2687, 11 June 1974), all of which have since become weedy in the bushland.

There are also records of weeds that flourished briefly and have now vanished, e.g.: *Cistus villosus* (Selk 1944) on Mount Eliza Scarp, or *Rhus integrifolia* (Selk 2895) in disturbed bushland near the tennis court. These collections may well grow in importance over time.

Grosvenor is commemorated with *Hibbertia selkii*, a lovely plant endemic to the Stirling Ranges. A quiet, unassuming man who confided to me that he had discovered his true passion (Botany) after he had retired from working for Shell in places like Paris and Iran. Grosvenor had a pivotal role in the development of both the gardens and herbarium at Kings Park.

Publication

Selk, G. (1975). An Inventory of plants in Kings Park and Botanic Garden. *Kings Park Research Notes* 4. Kings Park and Botanic Gardens, West Perth.

This publication listed 2,936 species (975 genera from 176 families) either cultivated or present in the bushland of Kings Park. For this Grosvenor and Pauline found at least 6 new records for the bushland (*Adriana quadripartita*, *Hovea pungens*, *Petrophile media*, *Schoenus brevisetis*, **Centaurea melitensis* and **Dischisma capitatum*).

Acknowledgements

Eng Pin Tay for access to the accession books and KPBG. Belinda Cahill for access to the old annual reports and Board minutes.

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ASBS Inc. Business

Postscript to the ASBS 2009 Conference and workshop on "National accreditation of providers of biological identification"

1–3 December, University of New England, Armidale NSW.

2009 Conference Website updates

The final version of the program and abstracts for talks and posters are available online from <http://www.anbg.gov.au/asbs/conferences/2009-UNE> along with the formal photo of the conference participants taken by UNE photographer David Elkins. I have also placed some images from the beginning, middle and end events of the conference, plus two by Trevor Wilson (thanks, Trevor). Please let me know if you want any of these images removed from the site or if you want

higher resolution files. Use this URL to get to the images and then click on any image you want to look at: <http://tinyurl.com/y9gct3t>

Accreditation and quality assurance in biological identification

The theme of the conference workshop was "National accreditation of providers of biological identification". The panel included David Coates (WA DEC), Tim Entwisle (BGT Sydney), Klaus Koop (NSW DECCW), Cameron Slatyer (ABRS), and I chaired the session. Greg Elks (Ecological Consultants Association of NSW) could not make the workshop due to a last minute court hearing relating to an environmental case! There was good debate on the topics of accreditation and quality assurance in identification and there was general agreement on the value of quality assurance, even if the pathway and funding to achieve QA in biological identification are not clear-cut. Discussion flowed through to the vexed issues of pressures and constraints on consultants on the

one hand and for herbaria on the other to deal with the quantity and quality of vouchers likely to be received by herbaria or the resources needed by them for curation of such material. These issues also raise the need for avenues for training.

Naturally, many issues were raised and few or none resolved. Peter Weston, as President of ASBS, referred to the workshop in the last *Newsletter*. To make progress in the discussion of these topics, to facilitate ASBS, CHAH, ABRIS and other Government agencies, environmental consultants, 'big' business, and any other stakeholders achieving agreement on purpose and pathway of QA in biological identification, a Wiki discussion site online has been set up, with

Accreditation of Providers of Botanical Identification

Belinda Pellow

Curator of the Janet Cosh Herbarium,
University of Wollongong

Australia has one of the strongest environmental regulatory systems in the world and each year, the community expects higher and higher standards of environmental planning. This has led to gradual improvement in scientific standards of assessment, although some aspects have developed more rapidly than others. For example, the information revolution has made it easier to consider existing data and adapt mapping for an environmental assessment, while some aspects of field investigation have lagged. One particular area of concern is biological identification, the foundation for accurate inventory which underpins sound environmental planning and assessment. Identification is a specialist task and can be time consuming and therefore expensive. Consequently, it can be sensitive to inexperience and cost savings, even though inaccurate or incomplete identifications will have a disproportionate effect on the quality of assessment. What are the major limitations on the quality of identifications and how can standards be improved?

Plant identification skills are one of the major deficiencies in environmental assessment. Failure to record many of the species present on a site, misidentifications, and inadequate verification and vouchering practices were especially conspicuous when I joined an environmental

the help of TRIN (special thanks to Garry Jolley-Rogers), where you can read and contribute to the debate and outcome.

At this stage, only the front page of the Wiki will be open to the public. You will need to sign in to read and post comments or articles. In turn, some items will be 'tidied-up' and reproduced in the *Newsletter*. By the time you read this item, the site will be ready for you to sign-up; please do and contribute to us achieving best processes, policies and funding for quality assurance in biological identification and curation of collections! Please go to http://wiki.trin.org.au/ASBS_ID_QA/ and register and participate; thanks!

Jeremy Bruhl, NE and UNE

consulting business three years ago. From the perspective of the 30 years I have worked at the tertiary level of teaching plant identification a decline in basic identification skills is also evident as, with a few exceptions, the number and depth of undergraduate courses in this field has declined and teaching resources have failed to keep pace with technological potential.

When most young graduates join a consulting business, they are not well-equipped with the basics skills required to become a good plant identifier. They often replace more senior staff, lack a suitably skilled mentor and, in a competitive business environment, are given few opportunities to interact with peers and develop their professional skills. Moreover, courses in skills for botanical consultants are few and far between and need to be followed up with many hours of plant identification to develop the skills of a good field botanist. Voluntary groups such as the recently formed FABS [Field Association of Botanists] in Sydney are aware of this and meet once a month to improve their skills, internships run by a number of state Herbaria also help to develop relevant skills in specimen collection, labeling and curation. However these initiatives cannot compensate for effective training at the Tertiary level prior to entering the industry or for targeted refresher courses for industry professionals.

One of the ways in which this should be addressed is by reversing the decline in the time dedicated to the teaching of plant identification at the tertiary

education level. Another is to establish a system of accreditation to ensure that botanists who undertake assessments have a standardized level of skill.

Peter Weston pointed out in his article in the December 2009 *Newsletter* the value of peer review in such a process. This recognises the work produced, rather than the workers that produce it, as the most appropriate target of a quality assurance system. Peer review is undertaken to some degree by the environmental officers in local government and it is not unusual for Councils to request a second assessment to verify (or revise, if necessary) the original. In addition, should a matter be referred to DECCW under threatened species conservation legislation (NSW) then some review of the consultant's reports will take place at this level. However, such reviews are not common practice. Furthermore, they are limited in scope, typically as desktop exercises. Without revisiting the site in question, it is only possible to assess the quality of the report on its methods and outcomes, while errors in identification or deficient sampling effort are largely undetectable. While these limitations in the review process need to be addressed, there also needs to be some way of being confident as best we can that the person who gathered the data on which the report is based had adequate skills and competencies.

In the past accreditation for environmental consultants has been suggested as one means of improving quality assurance by regulatory agencies, such as DECCW (NSW), as well as non-government organisations such as The Ecological Consultants Association of NSW. Presently the EIANZ [Environmental Institute of Australia and New Zealand] is attempting to set up a system of accreditation for environmental services but

Paying your dues

ASBS membership fees fall due in January each year. The December 2009 *Newsletter*, with the usual membership reminder, was a little late coming out, largely because of the timing of last year's AGM in Armidale. As a result, membership renewals have been a little slow to come in this year. As of 10 March, 118 members (36%) have paid their 2010 fees (113 individuals, 5 institutions). The Treasurer will soon come chasing (in an ever-

biological identification and taxonomy are not directly mentioned in the documentation about the proposed system which is on their website (see <http://www.eianz.org/aboutus/impact-assessment>).

ASBS, whose members understand the importance of good botany and the pitfalls of poor botanical practice, could contribute to this process by helping to develop criteria for accrediting botanists. A formal accreditation process would likely be the responsibility of a government organisation, but ASBS could assist as a knowledge broker and promote the role of State Herbaria in this process. As Peter pointed out in his article, instituting an independent review process for evaluating environmental impact statements and similar reports would require legislative change at both Commonwealth and State levels if it is to become compulsory. The same is true for any formal system of accreditation. ASBS would not be able to initiate nor control such a process, although it could encourage governments to initiate such reforms. CHAH could also be involved in this process. If accreditation was given legal status then consultants would have an incentive to invest in more training and accreditation fees may generate some revenue to support review and testing of skills and competencies.

ASBS can help to ensure that any broad-ranging accreditation system for environmental consultants incorporates standards for botanical assessment skills. By developing principles/criteria for relevant botanical skills, and making these available to potential stakeholders in any future accreditation process, we can promote the need to increase support for education and training and demonstrate our expertise and willingness to contribute.

so friendly way) those who have not yet paid their membership fees.

Electronic ASBS Newsletter

This year when you renew your membership you can opt to become (almost) a paper-free member. If you make this choice you will no longer receive a hard copy of the *Newsletter*, but will instead get an email from the Treasurer each time a new issue of the *Newsletter* is loaded on the ASBS website. Making this choice will potentially save paper,

postage, and money for the Society. Of course if you prefer the hardcopy *Newsletter* you can continue to receive this as usual. You can also change your mind about whether or not you want to receive the hardcopy by notifying the Treasurer

at any time. So far 30% of individuals renewing their membership (34 members in total) have opted to be paper-free.

Mike Bayly

Farewell to Simone Farrer

After more than ten years as Editor of both *Australian Journal of Botany* and *Australian Systematic Botany*, Simone Farrer has left CSIRO Publishing. Simone would be known to all ASBS members who submitted manuscripts to the journals for her quiet professionalism and high standards of editing. Based at the Collingwood office, she made a significant contribution over the last decade to maintaining the quality of both journals, which continue as important venues for publication of papers on the taxonomy and systematics of Australian plants. Simone ensured that the journals were on track as far as regular publication of issues, a vital factor in maintaining the ISI listing. She was also involved in introducing prizes for papers submitted by students and establishing high-profile review series.

members of the profession in academia and other institutions, rather than by the publishing house. Unfortunately, there was no place in this model for Simone. She left the journals in good shape for the transition to the new editorial arrangements now in place for both journals, with recent strong growth in the impact factor of *Australian Systematic Botany* in particular.

Before she left CSIRO Publishing, Simone donated numerous botanical books and journals, firstly to the library of Royal Botanic Gardens Melbourne, with the remainder to ASBS. The latter volumes were sold during a silent auction at RBG Melbourne last year and a total of \$1,100 was raised, which has been placed in the Hansjörg Eichler Scientific Research Fund. We wish Simone all the best for her future endeavours, and thank her for her dedication to the journals over many years and her parting generosity towards the botanical community.

Recent changes to the editorial structure at CSIRO Publishing introduced hands-on Associate Editors for each journal, with an external Editor-in-Chief. This model is similar to that of most current scientific journals, with editing carried out by

Tom May (former Chair, Editorial Board, *Australian Systematic Botany*) and Mike Bayly (Editor-in-Chief, *Australian Systematic Botany*)

H.M. BURKILL RESEARCH FELLOWSHIP

[Note: While the deadline for this grant has passed for 2010, a summary is presented here for those who may wish to consider applying in 2011–Ed.]

The Singapore Botanic Gardens is pleased to offer an annual Humphrey Morrison Burkill Research Fellowship on a competitive basis to a qualified botanist with special interest in the flora of South East Asia. The H.M. Burkill Research Fellowship is a generous bequest from Peter Burkill and Linda Upfill, the children of H.M. Burkill to honour their father and grandfather, I.H. Burkill. Its primary aim is to help promising young botanists to develop a career in tropical botany.

The fellowship offers the successful applicant a one-time sum of up to S\$4,500 for up to three weeks stay in Singapore to carry out research in the Singapore Botanic Gardens. The funds may be

used for research-related costs, including airfare, food and living expenses in Singapore.

Qualifications of the Applicants:

- * A PhD degree in Botany, or a post-graduate student in higher degree program in Botany at a recognised university.
- * Preferably below the age of 30.
- * Demonstration of strong interest and promising research skills/potential in tropical botany.

How to apply?

Contact: Dr. Chin See Chung, Director, Singapore Botanic Gardens, 1 Cluny Road, Singapore 259569; E: chin_see_chung@nparks.gov.sg

The deadline for applications for the first award of the H.M. Burkill Research Fellowship for the year 2010 shall be 31 March, 2010.



2010 Australian Systematic Botany Society Conference

Lincoln University, Canterbury, New Zealand

29 November – 3 December 2010

“Systematic botany across the ditch: links between Australia and New Zealand”

including palaeobotany, biogeography, phylogeny, algae, hybridisation, and
biosecurity/weeds

You are warmly invited to attend the 2010 ASBS conference in Lincoln, New Zealand,
hosted by the Allan Herbarium, Landcare Research.

CALL FOR PAPERS

Including palaeobotany, biogeography, phylogeny, algae, hybridisation, and biosecurity/weeds

Registration form:

Download Registration Form at:

www.landcareresearch.co.nz/news/conferences/asbs2010/registration.asp

Abstracts:

Download template / instructions at:

www.landcareresearch.co.nz/news/conferences/asbs2010/abstracts.asp

Email completed abstract to:

ASBS2010@landcareresearch.co.nz

Important dates:

- Early registration deadline: 27 August
- Abstract submission deadline: 30 September
- Standard registration deadline: 29 October
- Mixer and registration desk: afternoon/evening 29 November
- Registration desk: early morning 30 November
- Conference presentations and workshops: 30 November–2 December
- Conference dinner: 1 December
- ASBS AGM: starting late afternoon, 2 December
- Field trip, Arthur's Pass: Friday 3 December
- John Child Bryophyte and Lichen Workshop, Riverton, Southland: 4–9 December.
To follow AFTER conference, enquiries/registration to Allison Knight: alli_knight@hotmail.com



Conference costs:

- Member of ASBS, Botanical Society, NZPRN: NZ\$260 (early), NZ\$330 (standard)
- Non-member: NZ\$330 (early), NZ\$420 (standard)
- Other options including student and day registrations as per Registration Form
- Additional: Conference dinner, NZ\$70 per person; Field trip, NZ\$60 per person; Accommodation (see below)

Suggested accommodation options:

Accommodation is available at Lincoln University, near the conference venue. Please book on the registration form for this option (NZ\$65 per night including B&B).

Here are some other options if you wish to make your own arrangements:

Best Western	280 Riccarton Road	www.clydemotel.co.nz
Westside Motorlodge	298 Riccarton Road	www.westsidemotorlodge.co.nz
Ilam Motel	250 Riccarton Road	www.ilammotel.co.nz
Christchurch Motel	252 Riccarton Road	www.christchurchmotels.co.nz
Riccarton Motor Lodge	214 Riccarton Road	www.riccartonmotorlodge.co.nz
306 on Riccarton Motel	306 Riccarton Road	www.motel306.co.nz
Apollo Motel	288 Riccarton Road	www.apollomotel.co.nz

NOTE: Riccarton Road, Christchurch is approximately 5 km from Christchurch Airport and served by bus (www.metroinfo.org.nz/timetable_3.html), shuttles and taxis.

Riccarton Road is approximately 30 mins away from the conference venue at Lincoln by bus (www.metroinfo.org.nz/timetable_81.html).

Arthur's Pass field trip information:

- Weather permitting, we will visit the subalpine zone on the Main Divide of the Southern Alps, with a true alpine option (to the snowline and beyond) for fitter participants.
- Attractions: Mount Cook buttercup (*Ranunculus lyallii*), other subalpine herbfield plants such as snow tussocks, mountain and tree daisies, *Aciphylla*, *Veronica/Hebe*, *Dracophyllum* and *Phormium*; treeline species such as mountain ribbonwood and *Dracophyllum traversii*; colourful aerophytic algae; possibly snow algae and bird life such as the kea, New Zealand's famous alpine parrot. The trip is set in the dramatic surroundings of the upper Otira Valley below Mt Rolleston. En route to the Otira you will see vegetation changes reflecting the sharp rainfall gradient, limestone outcrops in Castle Hill Basin, and southern beech forest.
- You **MUST** bring: thermal top and leggings, warm jersey, thermal hat and gloves, **waterproof** jacket, sunscreen and sunhat, water bottle, snack food, and **sturdy** footwear.
- Lunch will be provided. Trip will depart 0730 and return 1900 (approx.).

Email:

ASBS2010@landcareresearch.co.nz



Landcare Research
Manaaki Whenua

NZPRN
NZ Plant Radiation Network

ABRS Report

Staffing

We farewell our director, Cameron Slatyer, who has accepted a position with the Department of Innovation, Industry, Science and Research. Cameron has been director of ABRS since September 2006, and during his time with us has overseen major changes to the grants program, and the introduction of the Bush Blitz program. He has worked tirelessly to promote the cause of taxonomy and forged partnerships with industry and other stakeholders. We wish him good luck in his future career. Pam Beesley will be acting director at ABRS until other arrangements are made.

We also farewell Katherine Selwood, who leaves at the end of March to start her PhD at ANU, and welcome Kate Gillespie, who will start in mid-March, working on Bush Blitz.

ABRS National Taxonomy Research Grant Program

The Research sub-committee of the ABRS Advisory Committee will meet on 24 and 25 March to assess the grant applications in the current round.

Bush Blitz

Bush Blitz was launched on 15 February 2010 by Environment Minister the Honorable Peter Garrett. Bush Blitz is a three-year multimillion dollar partnership between the Australian Government and BHP Billiton to survey and document the plants and animals in properties across Australia's National Reserve System. Other partners include the not-for-profit conservation organisation Earthwatch, rangelands survey group the National Scientific Reference Site Network and the Council of Head of Australasian Herbaria (CHAH). The Bush Blitz program has been developed, and will

be managed, by ABRS. Surveys will be conducted in National Reserves in all States and Territories over the next three years.

For more information about Bush Blitz visit the website: <http://www.bushblitz.org.au/>

As part of the Bush Blitz program, the taxonomic community is invited to submit applications for grants to undertake strategic taxonomic and molecular (barcoding) work in association with material collected on Bush Blitz surveys. Applications close on 2 April 2010. You can find information about the grants at: <http://www.bushblitz.org.au/taxonomy.php>

Atlas of Living Australia (ALA) project

ABRS and CHAH have received funding from the ALA for the National Species Lists Project, which aims to provide a comprehensive list of all Australian plants and animals for the ALA. Further information on this project can be found in the current ALA newsletter at: <http://www.ala.org.au/news/newsletters/newsletter-march-2010.html>

Flora of Australia

Volume 39 will soon be sent to press. We would like to acknowledge the tremendous contribution to this volume of Surrey Jacobs, who co-authored eight of the sixteen families included and was involved with the final editing and corrections to his contributions until September. He will be very much missed.

Once volume 39 goes to press, I will be working on volumes 26 (Meliaceae, Rutaceae and Zygophyllaceae) and 23 (Euphorbiaceae).

Annette Wilson
Editor, *Flora of Australia*

Books for review

Review copies of the following books are on offer. Please contact Russell Barrett if you would like to review one.

Ecosystem Response Modelling in the Murray-Darling Basin
(<http://www.publish.csiro.au/nid/20/pid/6350.htm>)

Wetland Habitats (<http://www.publish.csiro.au/nid/21/pid/6349.htm>)

Flora of the Otway Plain and Ranges 1 (<http://www.publish.csiro.au/nid/21/pid/6410.htm>)

Rainforest Restoration Manual for South-Eastern Australia
(<http://www.publish.csiro.au/nid/21.htm>)

And the Earthscan title;

World Atlas of Mangroves (<http://www.publish.csiro.au/nid/20/pid/6541.htm>)

Book reviews

More Marine Algae

John M. Huisman,

Biological Sciences & Biotechnology, Murdoch University, and Western Australian Herbarium

Algae of Australia: Marine Benthic Algae of Lord Howe Island and the Southern Great Barrier Reef 2. Brown Algae, by Gerald T. Kraft. 370 pages, CSIRO Publishing/Australian Biological Resources Study (ABRS). Hardback - ISBN: 9780643097377. AU \$140.00.

This volume is the fifth in the *Algae of Australia* series and the second authored by Gerry Kraft describing the marine benthic algae of Lord Howe Island and the southern Great Barrier Reef. The first, which appeared in 2007, dealt with the benthic green algae and was universally positively reviewed, leading to high expectations for this book and the planned future volumes describing the red algae. These expectations are clearly met, as this volume maintains and often exceeds the standard set by the earlier book.

As mentioned on the back cover, the book includes 7 orders, 12 families, 38 genera and 92 species of benthic brown algae. Two of the genera (*Lucasia* of the Sporochneales and *Herringtonia* in the Dictyotales) are newly described, as are 29 species. Each of the included species is described in detail and illustrated with a generous number of black and white photographs, the level clearly seen when one considers that the 92 species are illustrated by 107 composite figures, these often with over 10 individual images. In addition there are 12 plates of 72 excellent colour photographs, depicting the various localities, habitats and specimens *in-situ*. Each image is clear and informative and their quality makes the book enjoyable to browse, even when one is not mining it for information.

The format of the text is typical of most Floras

and includes identification keys, nomenclatural and type locality information, descriptions and comments. It differs slightly from the *Flora of Australia* series (also published by CSIRO/ABRS) and the two non-Kraft taxonomic volumes of the *Algae of Australia* series (Huisman 2006; Entwisle *et al.* 2007) in that taxa higher than genus are not described, and the location of type specimens

not given (other than for the new species). Neither of these omissions detracts from this volume and will only worry those slavishly devoted to rigid formats. As more than adequate compensation, the species descriptions, comments sections, and illustrations far surpass those of most Floras. A further variation is that several of the simply constructed taxa are grouped by habit rather than taxonomy; thus we have a section describing the filamentous 'Ectocarpoid Algae' separate from the larger pseudoparenchymatous Ectocarpales, and a section

'Myrionematoid Algae' for microscopic, often crustose species. This is clearly a practical response to a taxonomy that is presently "in a state of flux" (p. 19) and enables easy comparison between similarly constructed, if not closely related, taxa.

The invitation to review this book came at an extremely opportune moment, arriving as it did as I was sitting in a laboratory at Heron Island Research Station, participating in a survey of the marine algae of the Great Barrier Reef with Fred Gurgel of the SA Herbarium. 'Gerry's Greens' (Kraft 2007) was already in constant use and we were happily revisiting type localities and rediscovering many of the rare species described in that book, such as *Boergesenia magna* and *Codium gongylocephalum*. These new collections



are destined for DNA sequencing and ‘barcoding’, a technique unfortunately not suitable for the mostly formalin-preserved specimens of the earlier collections that are described in these volumes. The ability to visit precise type localities and collect authentic specimens of new taxa of brown algae was obviously an attractive proposition, and I requested that the review book be sent to me at Heron for a practical assessment. After it arrived we immediately visited Wistari Channel and easily located specimens of the distinctive deep-water genus *Lucasia*, and we were also successful in relocating many of the newly described taxa. Throughout this process the book was a delight to use; the keys are well designed, the descriptions incredibly detailed and the illustrations copious and informative. Perhaps of greatest value are the comments sections, wherein Gerry has highlighted distinguishing features and discussed any unresolved taxonomic conundrums. As most taxonomists will readily acknowledge, a revision will answer many questions but also invariably raise a few more, and this book will certainly instigate further research.

Do I have any criticisms? None worth mentioning here. Unlike most reviewers I had my chance to critique this book when my comments could actually make a difference, as I was privy to a pre-publication manuscript. This version was virtually identical to the final book and my (mostly minor) suggestions and corrections were incorporated (or ignored with good reason), so I’m hardly in a position to now be critical. One of those not adopted was that the taxonomic arrangement

differs from current usage in maintaining the order Cutleriales, whereas Phillips *et al.* (2008) include it as the family Cutleriaceae in the Tilopteridales. This latter scheme was always going to be a difficult one to accept, as on morphological grounds *Cutleria* would appear to be far removed from the Tilopteridales. Since only *Cutleria* is included in the present volume, Gerry argued for and adopted a prudent approach, retaining it in the Cutleriales.

This is an excellent volume of which Gerry can be justly proud. It maintains the high quality that has been a hallmark of his productive career, and sets a new benchmark that will force the rest of us to try that little bit harder. We should also congratulate the editor Pat McCarthy and publisher ABRs/CSIRO, for without their commitment it is unlikely that this book would have appeared in its present lavish form. It is truly a stunning work that will be a seminal reference for years to come.

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Australian Palms

Darren Crayn

Australian Tropical Herbarium, Cairns

***Australian Palms. Biogeography, Ecology and Systematics.* By John Leslie Dowe. CSIRO Publishing (published Feb. 2010). Paperback [only], 304 pages. \$AU140.00. ISBN: 9780643096158.**

John Leslie Dowe is a palm nut.

That statement is neither a playground jibe nor a misapplication of fruit terminology—this man loves palms. With this book he has entered into testimony a 304 page confession of his 20+ year obsession with all things Arecacean. And what a

thorough self-incrimination it is...

Palms in Australia (including the offshore territories Christmas, Lord Howe and Norfolk Islands) comprise 60 species in 21 genera, a numerically significant contribution to neither the Australian vascular flora (>20,000 spp.) nor the palm flora of the world (2,363 spp. in 183 genera). In this case however, the story is not in the numbers: the palm flora of Australia is noteworthy for being the only regional flora containing representatives of all five subfamilies of Arecaceae. Within Australia

the great majority of this remarkable diversity is found in NE Queensland—all five subfamilies, all mainland genera, and 37 of the 54 mainland species. Dowe lives and works in this part of the world, which may not be coincidental.

The Australian palm flora was last monographed in 1875 by Hermann Wendland and Oscar Drude, making this expert account from Australia's foremost arecologist over 130 years in the making.

Chapter 1 is a modest introduction and is followed by a synopsis (Chapter 2) of the personalities who made notable contributions to the knowledge of the Australian palm flora. Dowe has peppered his text with extracts from the writings of the luminaries, and expertly interpreted them in the light of modern knowledge. For example Alan Cunningham wrote of encountering “A dioecious palm of low stature...investing the River Hastings...” which Dowe interprets as the first documentation of *Linospadix monostachyos*. He explains this species is monoecious, with maturation of the male and female flowers separated by many months.

Chapter 3 treats the historical biogeography of the Australian palms. The fossil record is outlined in detail, including the New Zealand fossil palm flora. Dowe justifies this contextual extension on the basis of similarities in floristic development of the Eocene and Oligocene palaeofloras of the two areas. Admirably, Dowe refrains from promulgating simplistic and outdated notions. It would be easy to conclude that the relatively late appearance of palms in the Australian fossil flora relative to other regions of the world suggests dispersal into Australia, but the author considers alternative explanations for this. These matters are considered in more detail in Chapter 4.

Chapter 4 summarises the distribution and ecology. This is a broad brush treatment emphasising general macro-scale patterns and their possible

explanations—much finer distributional detail given in the treatments of individual species. *Livistona* and *Oraniopsis* are given special attention here due to their remotely distributed species: in the case of *Livistona* the celebrated *L. mariae* of central Australian gorges and *L. alfredii* of the Pilbara, and in the case of *Oraniopsis* the fact that the close relatives of this monotypic Wet Tropics genus are found no nearer than Madagascar and South America. Dowe is up-to-date with theory and evidence in the vicariance/dispersal debate and provides a critical assessment of both in relation to the origins of the Australian palms. There is a summary of research findings on

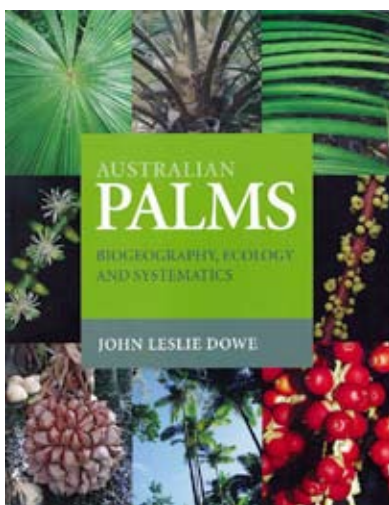
the responses of palms to fire and cyclones, and demography and population structure are also covered.

Chapters 5 to 10 are systematic treatments organised by subfamily and here Dowe hits his stride—the species treatments are comprehensive, informative, and mostly consistent within genera (a few minor inconsistencies were noticed). Keys are provided that allow identification of all named taxa, and the key diagnostic features for identifying genera and the species within them are tabulated at appropriate

places in the text. These are very helpful. The taxa themselves are richly illustrated with photographs of living plants *in situ* and type specimens. Close-up shots of inflorescences, infructescences and sectioned fruits (where required to illustrate key diagnostic features) complete the meal.

Rounding out the volume are chapters that deal with doubtful and excluded names (Chapter 12), and provide a comprehensive field key (Chapter 13) to all Australian palm species (supplementing the keys to genera, and species within each genus provided elsewhere in the book). A checklist of species and a glossary are helpfully included. A list of specimens examined in the course of the taxonomic review are available online.

While I found this a thorough and engaging treatment it would be a dereliction of my duty



as reviewer to not point out areas that could be improved. That these are very few is a testament to the quality of the work.

The quality of production is mostly first rate, and I found no grammatical or typesetting errors (and I'll gracefully take the flack from the first reader who does...). In a technical taxonomic work with complicated formatting requirements, this is no mean feat. One exception to the excellent production is the poor representation of the cladogram on p. 52—the text is highly pixelated.

One possible omission is the scanty material on human uses of Australian palms. Under “Economic Botany” on p. 5 is a single paragraph. There is considerable information scattered throughout the ethnobotanical literature and elsewhere on uses of palms by Aboriginal people in Australia. This information is not to my knowledge anywhere

collected conveniently for those interested in the value of palms to people, and this book provides the ideal context in which to set a distillation of this knowledge. Incorporating a consideration of Aboriginal cultural and trading practices in Dowe's research could potentially help illuminate some of the more puzzling aspects of palm biogeography in Australia.

Overall *Australian Palms* is a good book of considerable scientific merit. It is a comprehensive systematic treatment of a charismatic element of a world famous flora, last monographed over 130 years ago, and therefore will be of interest to anyone eager to know more about these iconic plants. I was sure I knew a little bit about palms before I encountered this book, and now I am twice as sure that I knew a lot less than I thought I did. That, I should add, is a strong recommendation to buy it.

Vegetation of South Australia

Gael Campbell-Young
Ecological Associates, Adelaide

***Mangroves to Mallee: The Complete Guide to the Vegetation of Temperate South Australia.* Todd Berkinshaw. Published 2009 by Greening Australia, Pasadena, SA. Printed carbon neutral. Hardcover (400 pages, A4). AU \$79.95. ISBN: 9780977514328.**

Todd Berkinshaw and his supporters have done a phenomenal job of producing this much-needed, niche-filling gem that has become my closest companion during assessment of plant communities. The book is essentially a field guide to the plant communities that occur in the southern agricultural districts of South Australia (SA).

The publication synthesizes information from a wide range of sources including plant identification guides, biological surveys, biodiversity plans, technical reports, floristic vegetation maps, electronic databases and online herbaria. The result is a ‘one-stop-plant-community-shop’ that can be used for instant plant community diagnosis, within relatively broad limits.

The book is not only useful for diagnosing and describing plant communities in the southern agricultural districts of SA, but it is helpful for everyone with an interest in protecting and

restoring these plant communities. The book promotes ecological restoration using species that are native to a particular community and area in an attempt to re-establish original ecosystems. An ideal condition will be reached when such a publication or an even more detailed one exists for every part of Australia!

Mangroves to Mallee is useful at all levels, from interested landholders or land managers to students, field officers, community groups, volunteers and professionals alike. On a personal level, I believe that every botanist should not go into the field without a publication of this nature, that is, if one exists for your area (and if not, write one, or at least take notes to contribute to one!). There is limited value in collecting a plant specimen without noting the plant community in which it is growing. I have collected plants in this way myself but now I see the error in the omission. For example, such information is essential for determining habitat requirements of threatened species whose fate may depend on the knowledge of which habitats it prefers. Similarly, a fragment of valuable native vegetation may be saved, simply by knowing which threatened species it could provide habitat for! Modern botanists seem to be collecting plant community information more and

more, which is a very gratifying observation. It has long been my belief (and I know that this view is shared) that there should be much more overlap between taxonomic and ecological methods when approaching plant studies in order to obtain a deeper understanding of how our ecosystems function and how we can better protect them to ensure their future survival.

Getting back to the book ... the A4, hardcover format does not necessarily lend itself to easy transportation in the field, but the layout, which is stunningly effective in its simple, succinct, informative style could not have been arranged better. The cover itself is most appealing, providing an instant appreciation for the beautiful and specialized flora and vegetation that is found in SA.

The brief yet informative introduction points the reader to the botanical regions of SA, describes the content of the book, refers to the sources of information consulted and shows a frightening map of the remnant native vegetation of SA's southern agricultural districts. The terms 'native vegetation' and 'agricultural district' could form an oxymoron in an Australian context, if one thinks of the unbelievably extensive clearing that has taken place in the agricultural districts. This is clearly reflected in the scantily-coloured map, with the colours indicating the patches of extant native vegetation.

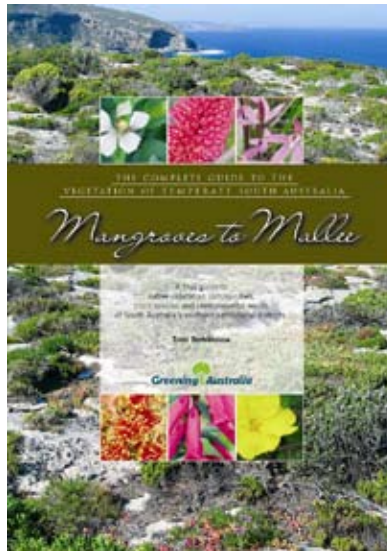
The first large section contains the plant community descriptions. These are grouped according to the broad landscape or vegetation types in which they occur, including coastal dunes, cliffs and mangroves; floodplains, wetlands and swamps; temperate forests and woodlands; mallee; temperate shrublands; grasslands and low sedgelands; and arid woodlands and shrublands. These landscape or vegetation types are confessed by the author to be somewhat subjective since many plant communities cross between two or more of these groupings. The classifications simply reflect

the author's opinion as to the dominant landscape or vegetation type for each community.

A double-page is devoted to each plant community description. A half-page colour photograph of the plant community in its pristine condition has been placed at the beginning of the description, with an easy-to-read title inserted below. The title provides the scientific and common names of dominant species and is followed by a listing of the conservation status, natural distribution (and distribution map, which is very helpful) and remnant area that the community occupies. These topics are briefly covered in more detail and reference is also made to species composition and structure, including the dominant species and commonly associated species. The description is followed by a list of common native species in the upperstorey, midstorey and understorey and a list of common weed species associated with the community. These listings continue on to the second page.

The second page contains five photographs (fitting into the top half of the page), showing examples of the community in various parts of its range and close-ups of two species that occur in the community. Reference areas are listed at the end of the section.

The following (and largest) section of the book is dedicated to descriptions of some of the most common species to be found in the district, listed alphabetically in the categories 'trees and shrubs', 'understorey' and 'bushland weeds'. Each plant description fills a quarter page, with a diagnostic photograph, followed by scientific name, common name, family, brief description, natural distribution with a map and notes on conservation status. The section on weeds is particularly helpful for identifying these species at a glance (when undertaking a time-constrained consulting survey—I could launch into an intense discussion on the pitfalls of environmental consulting as mentioned earlier in the *Newsletter*).



The last section contains appendices that list the distribution and conservation status of the major plant communities and species of SA's southern agricultural districts. There is also a list of the distribution and status of weed species of SA's southern agricultural districts.

In summary, *Mangroves to Mallee* contains over 1000 full colour images, describes 56 plant communities, 386 native plant species and 112 common weed species that occur in the southern agricultural districts of SA.

Todd Berkinshaw comments that compromises in the accuracy of the information are inevitably made when compiling such a broad publication. He indicates that whilst every attempt was made to respect the original intent of the data sources, liberties could have been taken to present information in a format that is more easily

understood by the reader and where possible such inaccuracies are acknowledged in the text.

The author explains that maps are intended only as a guide and that species lists are also intended as a statewide guide only and are not considered to be exhaustive or specific to any particular area of the state.

I can only think in retrospect how helpful this publication would have been when I first started examining plant communities in SA. However, having had to learn the 'hard way' has made me appreciate *Mangroves to Mallee* all the more, knowing how much effort and hard-earned knowledge is presented in the pages. The work of bringing together such a neat, targeted publication is to be applauded. If you have never thought about plants in the contexts of their communities before, *Mangroves to Mallee* serves as a good place to start thinking.

A history of PCR

David Morrison

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***The PCR Revolution: Basic Technologies and Applications.* By Stephen A. Bustin, editor. Cambridge University Press, 2010. xviii+307 pp. ISBN 978-0-521-88231-6 (hardback). AUD\$150.**

I'm usually not allowed into laboratories. I'm the sort of guy who never had buttons on his lab coat as an undergraduate, and so both the coat and my jeans often had large acid holes in them from leaning against the benchtop. My job in my lab group was to find out why we were doing the experiment and what result we were supposed to get, while the other members attempted to do the actual experimental work. By pooling our resources we all did pretty well. While I learned some worthwhile social skills (extracting information from the other lab groups), I failed to learn any of what you might call practical experimental skills—you see, most of my work was done in the coffee shop. I was not much better at fieldwork either, as I subsequently showed for 3 years of my PhD; and so I have spent a great deal of my later life sitting in front of a computer screen (or, nowadays, two).

I therefore have the required background for

reviewing this new book, since it is aimed at people who have some idea what PCR (polymerase chain reaction) technology is about but who are not necessarily involved in it themselves. Still, it could easily be read by the latter group, because what it tries to do is "tell the story of the PCR and to shine the light on some of the scientific advances that would never have happened without it."

To those of you whose biochemical training pre-dates 1990 (as does mine), I will say that the principle of PCR is quite simple. The objective is to increase the amount of selected DNA in a test-tube sample. This is done by getting a bacterial polymerase to do the job for you, since this macromolecule's usual job in a cell is to make copies of DNA. Heating the test tube causes the DNA's double strands to separate. If the DNA is immediately cooled, then any short strands of DNA (primers) that you might just happen to have put into the test tube will bind to the appropriate parts of the DNA. If you then heat the DNA a little bit, the polymerase will make a copy of the sequence between the primers. By repeating this 3-step process a number of times you will exponentially increase the amount of the selected

DNA. In practice, it is a bit more complicated than this, but the principle really is that simple.

PCR came into practical use in the mid 1980s (the patent applications were filed in 1985), although the boom did not start until the end of that decade. This boom is sometimes held up as an example of how rapidly some parts of science can change (Rabinow 1996), and the impact that these changes can have on entire disciplines. This was not a revolution in the Kuhnian sense, because there was no paradigm change. Instead, it was a practical revolution, opening up previously closed doors. Biology as a whole will never be the same as it was before the sequencing revolution, and systematics has been affected just as much as any other part of the biological sciences. Books such as *The PCR Revolution* can therefore be of interest, introducing the incredibly broad spectrum of PCR applications to those whose use of it is more limited.

There are 19 chapters arranged into two approximately equal groups: Basic Technologies, and Applications. Each chapter (average of 15 pages) is essentially a personal view from one or more of the people involved in developing the techniques or key uses. There is nothing particularly technical about the contents, although some basic biochemical knowledge is assumed, especially familiarity with the terminology. Indeed, the assumed level varies considerably between chapters, with some of the authors explaining everything in detail (which is often repeated in different chapters) and others assuming greater familiarity.

There is very little uniting the chapters other than the ubiquitous presence of PCR in one form or another, and the authors' obvious enthusiasm for it. Some chapters are quite anecdotal, reminiscing about a time two decades ago. Others are much more detailed, although still focusing on the development of the techniques and applications rather than on the mechanical aspects of the

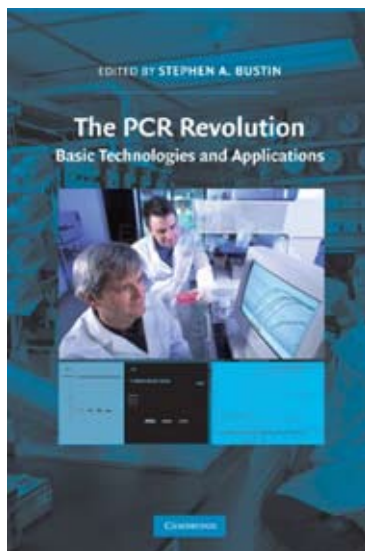
methods themselves (which are then relegated to literature citations). Breadth of scope is definitely here, as well as focus of attention, but there is no consistent target audience.

The chapters in the Basic Technologies section cover various aspects of the development of the techniques, from the original (qualitative) PCR to quantitative PCR and on to real-time quantitative PCR. Oddly enough, the best introduction to the development of PCR is in the final chapter of this section, by Nolan *et al.* (Chapter 9). If this chapter was placed first then the remaining chapters would follow more logically.

The obvious story missing from this section is that of Kary Mullis, the usually acknowledged instigator of the technique in 1983. A similar idea had previously been published by Kleppe *et al.* (1971), and the whole affair ended up with a court case between the DuPont and Cetus corporations. After all, this was big business: Cetus, one of the first biotech start-ups, got \$US300 million when they sold the patents to Hoffmann-LaRoche. (At the same time, Cetus itself was merged with another biotech pioneer, the

Chiron corporation.) Furthermore, PCR is reported to have earned approximately \$US2 billion in royalties for the various rights holders, by the time the first of its core patents expired in 2005 (Fore *et al.* 2006).

Mullis has told his version of the story several times (1990; 1994; 1998), so its absence here will be noted only by the uninitiated. Mind you, his version is seriously disputed by the many other people involved (see the discussions by Rabinow 1996 and Fore *et al.* 2006). Indeed, the first publication concerning PCR was about an application of the process (Saiki *et al.* 1985), while Mullis' theory paper was rejected by both *Nature* and *Science* (Fore *et al.* 2006). Apparently, this paper was assessed as "merely technical and unoriginal" (Fore *et al.* 2006, p. 5), which may be the scientific equivalent of turning down the



Beatles. *Science* later tried to regain some lost ground by selecting PCR as the major scientific development of 1989.

Many of the techniques discussed in the Applications section of the book are unlikely to be of much immediate practical use to systematists, who have so far focused mainly on the simple determination of gene sequences. Most of the more lucrative applications were “unplanned” rather than being the result of explicit business strategies. Medical diagnosis and treatment play much the largest role in the Applications section, getting six of the ten chapters. This reflects the initial impact of PCR technology (in 1986), which was mainly in human diagnostics—PCR did not become a basic research tool until later on (1989). Perhaps the most directly relevant chapters for a systematist are those on ancient and archival DNA, the business of so-called ‘molecular archaeology’, although genetic variation is another obvious topic.

Sadly, the chapter on ‘archival material’ (Chapter 16) defines its subject matter as “‘old’ tissue samples stored in the deep freezer in the laboratory, air-dried by nature and stored at a dry place (e.g. a cave), or tissue frozen by nature and stored below 0°C by nature (e.g. in Alpine glaciers or the permafrost of Siberia or Alaska).” You will note that this definition seems to exclude herbarium and museum specimens, and indeed the author remains blissfully unaware of them. He makes a big song and dance about the “major breakthrough in medical research” of being able to combine modern biology with the “‘dormant knowledge’ collected over the last decades in the archives”, without noting that systematists discovered and started exploiting this idea several centuries ago. It still amazes me just how ignorant of our discipline even well-educated people can be, and just how often the wheel can be re-invented by people who should know better.

Indeed, the biggest limitation of *The PCR Revolution* is its focus on diseases and medicine, as though the rest of biology does not exist. There are probably several stories missing from this section of the book, but to us the use of PCR in evolutionary biology is the most obvious of them.

For example, the study of genetic variation is probably more abundant outside of medicine than inside it, but you would never know it from this book. Most of the discussion of it in Chapter 18 is actually quite general (and well written) but any time that a specific example is mentioned it is always medical in nature. Indeed, the only chapter in which biology gets at least equal time with medicine is in Chapter 19, on ‘ancient DNA research’. Here, we get to hear about quaggas and moas, mammoths and bison, and even cave bears and cave hyenas. Sadly, the only way that a non-human can get into this book is to be extinct.

Needless to say, this final chapter of the book is not only the most relevant to systematists (it is the only chapter containing the word ‘phylogeny’, and the only one acknowledging the existence and usefulness of museum specimens) it is also the most interesting. Using PCR it is possible to study specimens containing only a single DNA molecule, although this comes at the expense of almost certain contamination from modern DNA. Nevertheless, ancient DNA has been used to study everything from phylogeny to population genetics to vegetation communities. Due to the inevitable degradation of the DNA molecules, the current practical age limit is apparently about 500,000 years, and most studies are restricted to short sequence reads.

I quite enjoyed this book, despite the variable quality (and quantity) of the presentations and the blatant bias. However, I couldn’t help thinking about the sadness of technological revolutions, in spite of (or perhaps because of) the enthusiasm of the authors. For instance, relatively simple sequencing techniques first came into practical use in the mid 1980s. I well remember the fate of one of my student office mates, who was working on bacterial DNA sequencing for his PhD in the early 80s. At the end of his time he repeated the entire previous 3 years’ of laborious lab work in 3 weeks with the new technology. At least fieldwork is never like this.

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Botany on trial

Forensic Botany: cases from Queensland

Ailsa Holland
Brisbane Herbarium

The solving of crimes from fragment and pollen identification is a little known aspect of botanical work associated with the service side of a herbarium, particularly those attached to State Government Departments. In Queensland, this work has included a number of interesting cases over the past 30 years, from all parts of the State. Botanists at the Queensland Herbarium have been called upon as expert witnesses to help solve major crime including drugs, robbery and murder.

Great train robbery

Gold was transported from north Queensland to Brisbane by train under high security. How then did it happen that the bags, when opened in Brisbane, contained only soil, leaf fragments and snail shells? The leaf fragments belonged to a species of rainforest tree only found north of Bowen and the snail shells were identified as a species only found north of Ayr. This information assisted the police in narrowing down the area in which the heist occurred.

Flower haired thief

In a sleepy small town, an orange-flowered shrub was growing under a Jacaranda, which provided good cover for the thief who climbed in through a window. The police had their man but had little to go on—just a few flowers and leaves from his hair. They were identified as *Streptosolen* flowers and Jacaranda leaves. A later inspection confirmed that the property in question was the only one in town that had these two species.

Stolen aircraft

A light aircraft mysteriously went missing and then turned up at the same airfield in a few days time. Just before the theft, the plane had been thoroughly cleaned, but the returned plane had mud with grass on the tyres. The grass turned out to be a species of *Poa* only found in a limited area of NSW, and assisted the police in directing their enquiries.

Angel trumpet party

A young teenager brewed tea from a nearby Angel's trumpet bush and adding it to the punch at a party. The death of a girl was the result. The pieces of leaf material from the punch was verified as *Brugmansia x candida*.

Skullcap skunk

We first encountered the odd looking “skunk” cannabis in a case involving “herbal” tea. The defendant apparently thought that he was taking the herb “skullcap”. Skunk is a low-growing bushy cultivar that has palmately divided leaves rather than the usual digitately compound leaf. Under the microscope, however, the features were unmistakable.

Body in the creek

A body had been dumped in a black soil creek – unusual country with very distinctive vegetation. The police had their suspect, and his car, and were trying to link the car to the place where the body was dumped. Grass seeds were found to be embedded in the mud on the tyres. The seeds were identified as a species of grass only found in the unique habitat where the body was found. Under cross examination, the verification of herbarium information was questioned: were all the specimens/records collected and identified by qualified botanists?

Poppyseed tea

In Queensland, opium poppy seeds are legal, available over the counter for culinary use, but are supposed to be not viable. A number of poppies were found growing on a property but the defendant claimed that they was simply making poppy seed tea and throwing out the dregs. Two germination tests were carried out: one showed that poppy seeds bought in the supermarket were indeed viable (at this time), but the other showed that hot water killed the seeds.

Trampled flowers

A woman was murdered in a house while two relatives were at home. Was one of them a murderer or did an intruder somehow get in? The only evidence for an intruder was an area of flattened busy lizzies (*Impatiens* spp.) under a window. The evidence given was that these plants are very weak-stemmed and therefore would be flattened by any large body passing through them. However, the passage of a dog could not be ruled out, so the evidence was thrown out.

Grass in the radiator

In another murder case, numerous bags and packages were brought to the Herbarium, including grasses from the site of the attack, another set from the location of the body, and the entire radiator of the defendant's car, packed full of long grass. After days of painstaking work, the species from each set were identified, and the lists compared. All were common weeds, but there was a good correlation between the three sets, for five species. However, this evidence was considered peripheral to the case.

Fossil pollen

A body of a man was found in a river. The house of a suspect, many miles from the river, was searched. Boots were found, and the mud scraped off and examined for pollen and other fragments. Curiously, the pollen turned out to be mainly fossil pollen normally found only in coal. Hours of cross examination finally established beyond doubt that the mud on the boots could only have come from one section of the river where there was a historical coal loading site, where the body was found.

Mushroom poisoning

Death by mushroom poisoning is always horrible, but was it accidental? Two people ate the sauce made from a local species of bolete, and only one survived. Boletes are normally considered to be low in toxicity, but on visiting the property, deathcaps (*Amanita* species) were found nearby and contamination was a possible. However, post mortem results were nil for aminitin. The coroner determined accidental death by mushroom, by an unknown species of bolete.

Peyote cure

Until recently, the peyote, as a species, was not listed in Queensland legislation, but the chemical was. This created a slight problem for those who wished to grow the species horticulturally. One case, however, caught the eye of a police officer—a small cactus showing signs of cutting. It was identified as peyote (*Lophophora williamsii*) but the defendant insisted that he had been using it to treat a sore, apparently with good results. Whether this testimony was useful or not is unknown.

Taxonomy in the press

A recent article “The most daunting task in Australia” by Greg Guerin has been published in *Cosmos Magazine* and can be found at this URL:

<http://www.cosmosmagazine.com/opinion> OR

<http://www.cosmosmagazine.com/features/online/3406/the-most-daunting-task-australia>

The article features Juliet Wege (WA Herbarium), John Jennings (University of Adelaide) and Christine Lambkin (Queensland Museum) and is basically about the status of taxonomy in Australia in terms of the science and the workforce. The article details some of the challenges faced by taxonomists and provides a realistic assessment of the volume of work still to be done.

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<i>Council of Heads of Austral- asian Herbaria (CHAH)</i> Chair: Dr Brett Summerell (NSW) brett.summerell@ rbgsyd.nsw.gov.au or www. chah.gov.au/	ABRS tel: (02) 6250 9417 fax: (02) 6250 9555 email: abrs@environment.gov.au www.environment.gov.au/ biodiversity/abrs/	<i>Australian Botanical Liaison Officer (ABLO)</i> Position Vacant Herbarium, Royal Botanic Gardens, Kew Richmond, Surrey TW9 3AB England tel: 44-20-8332 5270; fax: 44-20-8332 5278 email: ablo@kew.org	

ASBS Publications

History of Systematic Botany in Australia

Edited by P.S. Short. A4, case bound, 326 pp. ASBS, 1990. \$10; plus \$10 postage & packing.

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

Only a few copies left!—available only from the Treasurer.

Systematic Status of Large Flowering Plant Genera

Austral.Syst.Bot.Soc.Newsllett. 53, edited by Helen Hewson. 1987. \$5 + \$1.75 postage.

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

Australian Systematic Botany Society Newsletter

Back issues of the *Newsletter* are available from Number 27 (May 1981) onwards, excluding Numbers 29, 31, 60–62, 66, 84, 89, 90, 99, 100 and 103. 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, apart from \$1.75 for the Large Genera issue (Number 53).

Evolution of the Flora and Fauna of Arid Australia

Edited by W.R. Barker & P.J.M. Greenslade. Peacock Publications, ASBS & ANZAAS, 1982. \$20 + \$8.50 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.

Also available from Peacock Publications, 38 Sydenham Road, Norwood, SA 5069, Australia. To obtain this discounted price, post a photocopy of this page with remittance.

Ecology of the Southern Conifers (Now out of print)

Edited by Neal Enright and Robert Hill. ASBS members: \$60 plus \$12 p. & p. non-members \$79.95. Proceedings of a symposium at the ASBS conference in Hobart in 1993. Twenty-eight scholars from across the hemisphere examine the history and ecology of the southern conifers, and emphasise their importance in understanding the evolution and ecological dynamics of southern vegetation.

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AUSTRALIAN SYSTEMATIC BOTANY SOCIETY INCORPORATED

The Society

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

Membership

Membership is open to all those interested in plant systematics. Membership entitles the member to attend general meetings and chapter meetings, and to receive the *Newsletter*. Any person may apply for membership by filling in a "*Membership Application*" form, available on the Society website, and forwarding it, with the appropriate subscription, to the Treasurer. Subscriptions become due on 1 January each year.

The ASBS *annual membership subscription* is AU\$45; full-time students \$25. Payment may be by credit card or by cheques made out to *Australian Systematic Botany Society Inc.*, and remitted to the Treasurer. All changes of address should be sent directly to the Treasurer as well.

The Newsletter

The *Newsletter* is sent quarterly to members and appears simultaneously on the ASBS Website. It 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. *Citation*: abbreviate as *Austral. Syst. Bot. Soc. Newslett.*

Contributions

Send copy to Russell Barrett and Peter Jobson at the addresses given below. They *preferably* should be submitted as: (1) an MS-DOS file in the form of a text file (.txt extension), (2) an MS-Word.doc file, (3) a Rich-text-format or .rtf file in an email message or attachment or on an MS-DOS disk or CD-ROM. *Non-preferred media* such as handwritten or typescripts by letter or fax are acceptable, but may cause delay in publication in view of the extra workload involved.

Formatting of submitted copy. Please use Word in formatting indents, bullets, etc. in paragraphs and for tables. Do not format primitively with tabs, which change with the Normal style sheet. If embedding tables or references or other Objects from other software (Excel, bibliographic software, etc.) ensure that these are converted to Word tables or paragraphs. Letters in abbreviations of Australian States (SA, WA etc., but Vic.) and organisations (e.g. ASBS, ABRS) should not be separated by full-stops, but initials should be (e.g. W.R. Smith, not WR Smith).

Images: their inclusion may depend on space being available. Improve scanned resolution if printing your image is pixellated at a width of at least 7 cm (up to a 15 cm full page). Contact the Editors for further clarification.

The *deadline* for contributions is the last day of February, May, August and November. All items incorporated in the *Newsletter* will be duly acknowledged. Any unsigned articles are attributable to the Editors.

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.

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Advertising space is available for products or services of interest to ASBS members. The current fee is \$100 per full page, \$50 per half-page or less.

Flyers may be approved for inclusion in the envelope for products or services of interest to ASBS members. The current fee is \$100 per flyer, plus the cost of inserting them (usually roughly \$25–30). Flyers are not part of the *Newsletter* and do not appear with the *Newsletter* on the ASBS Website.

A 20% discount applies for second and subsequent entries of the same advertisement. Advertisements from ASBS members are usually exempt from fees but not the insertion costs in the case of a flyer. Contact the *Newsletter* Editors for further information.

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Contents

Australian Systematic Botany Society Newsletter 142 (March 2010)

From the President	1
From the Editors	1
Articles	
The discovery and documentation of the eucalypts of Queensland and New South Wales, 1896–1961	2
Grosvenor Selk—Kings Park Herbarium Curator and Volunteer	6
ASBS Inc. Business	
Postscript to the ASBS 2009 Conference and workshop on “National accreditation of providers of biological identification”	8
Accreditation of providers of biological identification	9
Paying your dues	10
Farewell to Simone Farrer	11
H.M.Burkill Research Fellowship	11
ASBS 2010 Conference	
Systematic botany across the ditch: links between Australia and New Zealand	12
ABRS Report	14
Books for review	14
Book reviews	
More Marine Algae	15
Australian Palms	16
Vegetation of South Australia	18
A history of PCR	20
Botany on trial	23
Taxonomy in the Press	24