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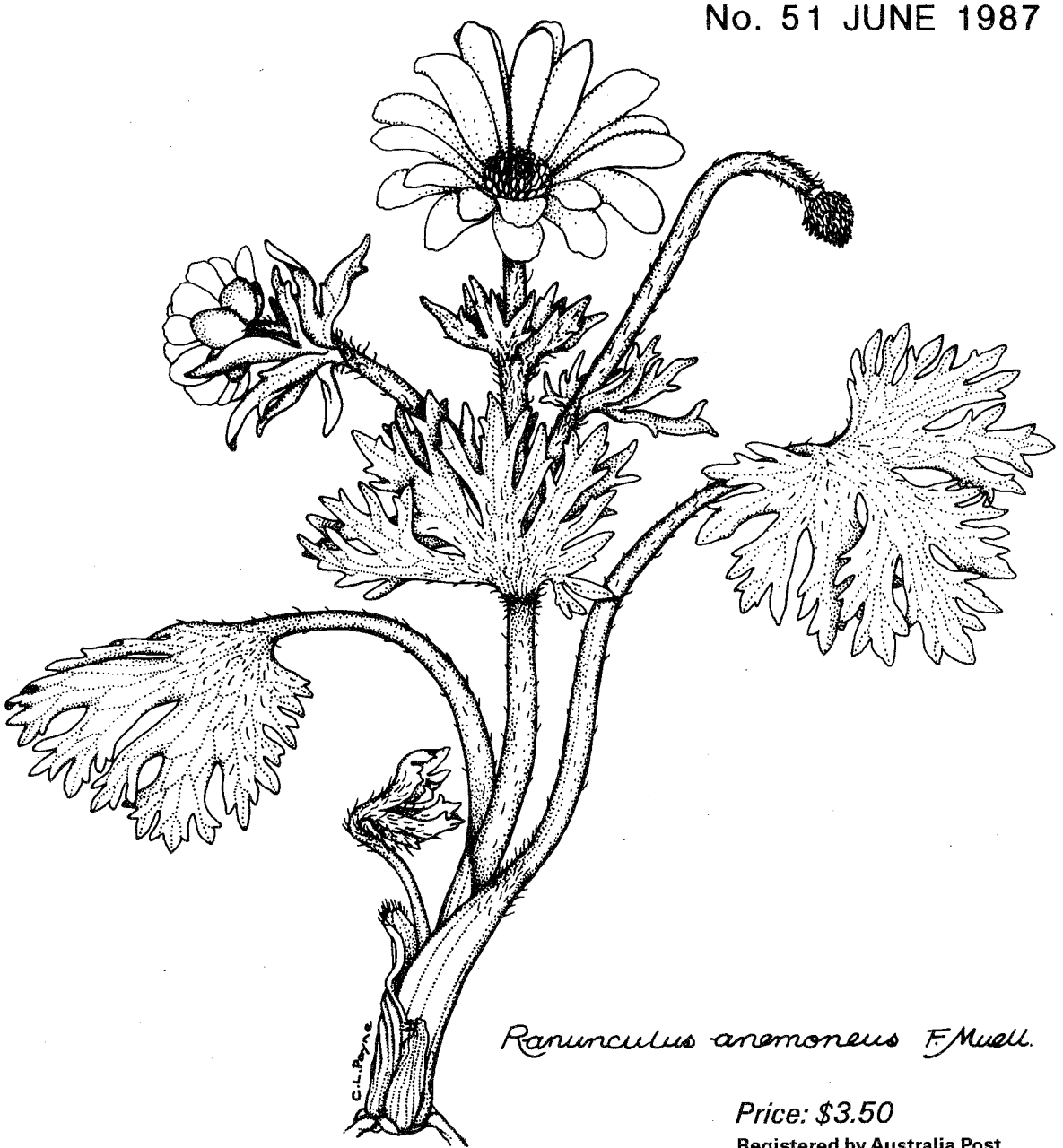
No. 51 JUNE 1987



Ranunculus anemoneus F. Muell.

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THE DATA SYSTEMS OF THE WESTERN AUSTRALIAN HERBARIUM

J.W. Green
Western Australian Herbarium

The Western Australian Herbarium has assembled a comprehensive set of integrated, computer-based systems for collecting, editing, managing, retrieving and printing specimen label data. The purpose of this article is to summarise these systems, and to draw attention to detailed papers on particular aspects.

1. Field data collection.

A specialised data base system, comprising original software and using either the Sharp PC1600 pocket computer or the Epson PX-8 lap-top portable, has been established and tested. This allows field data to be entered directly as specimens are collected, facilitating editing and data manipulation during specimen preparation and permitting fast preparation of labels.

The field system was inspired by the release of the remarkably miniaturised Sharp machine, which has 80 kp of RAM yet can easily be hand held and belt-mounted. This allowed the writer to develop quite a sophisticated program, complete with editing, updating and repetition facilities, yet still leaving room for storage of some 30 specimens per file. Since each file is easily transferrable to microfloppy disk, and each disk holds over seven full files, the capacity for specimen storage becomes limitless in practical terms. Furthermore an associated printer allows hard copy to be taken when convenient, e.g., daily. Bar codes can be used as field identifiers if desired.

The above program has been adapted to run on the Epson lap-top, which confers a number of advantages on users who stay close to a vehicle or a fixed field station with power supply. More specimens can be collected per file, editing facilities are better (via Portable WordStar), the keyboard is full-sized and data can be saved on microcassettes. Also, a bar code reader can be attached if required. However, if printed output were required a separate printer would be needed, and probably a mains power supply to run it.

For further details see references (1) and (2).

2. WAHERB, the main specimen data base.

The W.A. Herbarium uses the TITAN Information Management System, running on a Unison D21 microcomputer, to record specimen label data. During the first phase, which commenced in 1985, some 60,000 specimens were entered, comprising the taxa Amaranthaceae, Orchidaceae, Poaceae, Asteraceae, Acacia, Droseraceae, some Papilionaceae and the plant pathology collection. This phase was made possible by ABRS and CEP grants, but is now at an end, owing to termination of grant support. Further funding is being sought to continue. Current acquisitions in logged taxa are being inserted by regular staff, as time permits.

Even the small percentage so far entered has proved useful: many requests for retrievals have been satisfied and the system has been used for research and to document loans.

Data acquired in the field, using the system mentioned above, has been transferred from the Sharp and Epson to the Unison, where it will be loaded into either an intermediate TITAN database or directly into WAHERB, depending on circumstances.

Labels have been produced directly from both Sharp and Epson field data, using a program developed by the writer. Alternatively, labels can be printed via TITAN using a Unix script written by the TITAN support team. Such a script has been used successfully by herb. NSW, and is expected to be running at PERTH shortly.

For further details see (3).

3. Bar codes.

The W.A. Herbarium has pioneered the use of specially printed bar code number stickers as unique specimen sheet identifiers which serve as the key numbers essential for data base purposes as well as facilitating fast accurate recording of data by light pen. While the data base is incomplete, they also serve to indicate which specimens have been entered.

Normally bar codes are applied at the time mounted specimens are entered into the data base. An alternative usage was tested in the field: backed bar code stickers were placed in cellophane bags which were stapled to specimens as they were collected. These numbers were then entered into the field data computer, while normal sequential personal numbers were generated internally. As the field system now stands this bar code procedure is available as an alternative to the use of conventional collection numbers.

We chose Data Logic bar code reading equipment, because it is dedicated to that purpose. A slightly cheaper alternative is available to owners of an Epson PX-8, which has the option of a bar code interface and then only requires the wand (pen). We rejected this as we foresaw as unsatisfactory the Epson being constantly removed for other purposes.

Further details are given in (4).

4. Latitude-longitude from plain language locality data.

The writer has developed a program for computing latitudes and longitudes from a variety of plain-language locality expressions, exemplified by the following: (1) 4.2 km NW of Moora; (2) 435 mile peg, North West Coastal Highway; (3) 13 km from Beverley towards Brookton; (4) Between Condingup and Esperance; (5) 6 miles past Williams on the Albany Highway; and (6) Coolgardie.

The program is in FORTRAN, runs on the Department of Agriculture's Prime 9950 and utilises data supplied on tape by the Main Roads and Lands and Surveys Departments, notably a W.A. gazetteer of some 44,000 entries. Plans are afoot to integrate it into the TITAN system, and provision for this has been made in WAHERB in the form of special locality fields for direction, distance, etc.

The output contains, in addition to latitude-longitude position, a precision code and map reference, to facilitate subsequent refining if desired. Comparisons with manually-determined positions have revealed an accuracy in the order of 2-4 km. At present computation is relatively slow (mean 34 sec.) owing to sequential file-searching, but work in progress is expected to reduce this time significantly.

For further details see (5).

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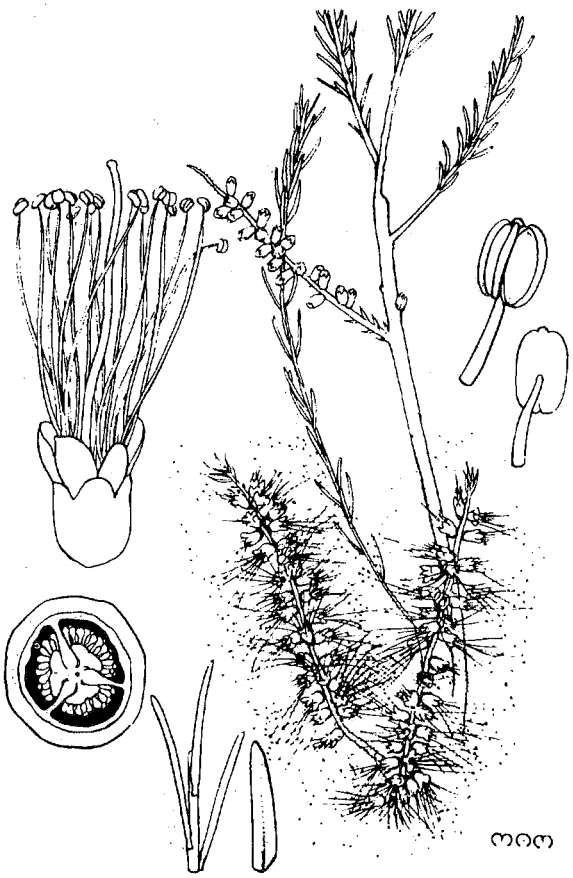
(2) Green, J.W. The manifold uses of the Epson PX-8 lap-top portable computer in herbarium work. A.S.B.S. Newsletter this issue.

(3) Green, J.W., Macfarlane, T.D. & Maslin, B.R. WAHERB, the specimen data base of the Western Australian Herbarium. Submitted to Taxon.

(4) Macfarlane, T.D., Green, J.W. & Maslin, B.R. Bar code specimen sheet numbers in use in the Western Australian Herbarium. Submitted to Taxon.

(5) Green, J.W. The calculation of latitude and longitude from plain language locality data. Kingia 1(2) (in press.)



Melaleuca lateritia

from

The Flora of the Perth Region

IN DEFENCE OF MELALEUCA ERUBESCENS

Peter G. Wilson
National Herbarium of N.S.W., Sydney

In a recent paper, Byrnes (1986:266) places M. erubescens Otto in synonymy under the name M. diosmatifolia Dum.-Cours. because of the priority of the latter name. However, it should be pointed out that the epithet 'diosmatifolia' is merely an orthographic variant of 'diosmifolia', a fact that was recognized by Bentham (Fl. Aust. 3:159), de Candolle (Prod. 3:214), Cheel (Proc. Roy. Soc. N.S.W. 58:189) and, presumably, Otto himself but not explicitly spelt out by any of these authors. Byrnes is, therefore, in error when he suggests that these authors misspelled the name as 'diosmifolia'; Dumont de Courset was the one with the spelling problem!

The second part of the generic name Diosma, from which the epithet is derived, is a Greek first declension feminine noun (osme) of which the combining stem is osm-, derived from its genitive osmes. The name Diosma is therefore only superficially similar to names ending in third declension neuter nouns such as derma and stoma which have the stems dermat- and stomat- as shown in their genitives dermatos and stomatos.

There is no other possible way of arriving at a stem 'diosmat-' (i.e., there is no generic name Diosmatos or noun 'diosmatum' or similar) so the epithet is an orthographic error and should be corrected (I.C.B.N., Art. 73.8). M. diosmifolia Dum.-Cours. (Bot. Cult. ed. 2 5: 373, 1811 'diosmatifolia') is a later homonym of M. diosmifolia Andr. (Bot. Repos. 476, 1807 'diosmaefolia') and must be rejected as superfluous.

ACKNOWLEDGEMENT

My thanks to Drs B. Briggs and L. Johnson for their helpful comments on an earlier draft of this note.

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Byrnes, N.B. (1986). A revision of Melaleuca L. (Myrtaceae) in northern and eastern Australia, 3. Austrobaileya 2(3): 254-273.

THE MANIFOLD USES OF THE EPSON PX-8 PORTABLE LAP-TOP COMPUTER IN HERBARIUM WORK

J.W.Green
Western Australian Herbarium

The handling of botanical data in the Western Australian Herbarium (and doubtless many others) has been revolutionised in the last decade by the advent of computers, to the point where they impinge on almost every aspect of herbarium work.

The W.A. Herbarium presently utilises a range of machines from a large, central departmental 'main frame' to highly miniaturised pocket machines for field data logging. Among these, however, nothing quite compares for versatility with the Epson PX-8, a light portable or 'lap-top'.

This paper describes a variety of applications involving the use of this machine in the Western Australian Herbarium, including character-scoring, paper-writing, logging specimens in remote herbaria, program development, logging field collections, label-printing and the preparation of Delta system data files. The PX-8 can be used to read bar-coded specimens and is even used to transmit across the city typing work done by a disabled employee working at a remote location.

1. Personal taxonomic research.

The PX-8 first came to notice when one was purchased for my colleague Mr N.S. Lander, who wanted it to record specimen data when he visited various overseas herbaria during his assignment to Kew as Australian Botanical Liaison Officer, in 1984-85. He successfully recorded label details from some 5,000 specimens during visits to eleven British, European and American herbaria, enabling him to collect more information than could be recorded manually. Moreover the data could be edited on the spot, using portable WordStar. As the RAM disk became full he simply copied the file onto microcassettes. This system furthermore enabled him, at each institution visited, quickly to retrieve earlier data, helping to avoid unnecessary duplication of effort. Mr Lander developed a suite of simple BASIC programs to allow various data manipulations such as sorting records on any field and checking for errors.

Subsequently, on returning to Perth, he was able to transfer the data to the central, departmental Prime machine, on which he had constructed a data base to suit his taxonomic methodology.

Besides the above function, the PX-8 proved invaluable to Mr Lander as a word processor for writing and printing letters and articles, and as a terminal to the Prime.

Considerable interest was shown among the staff of the various institutions he visited, resulting in some of them following suit, as indeed have taxonomists elsewhere.

2. Field specimen data logging.

A field data system, which had originally been developed by the writer for use with the Sharp PC1600 pocket computer (Green 1987), was adapted to run on the PX-8 to suit users familiar with the latter machine, or those not requiring the battery-operated portability of the

Sharp. The field data base program was called CBK ('collecting book'). An associated program called LABELS enabled conventional herbarium specimen labels to be printed directly from CBK data files. As the two machines shared the programming language BASIC the Sharp verion was easily adapted for use on the PX-8.

In describing the Sharp-based pocket system in detail Green (loc. cit.) alluded briefly to the lap-top alternative. The Epson PX-8 has the advantages of greater memory, full-sized keyboard, better field editing facilities (Portable WordStar) and a built-in microcassette drive, but it lacks the Sharp's battery-operated, integrated floppy disk drive and printer, and is more bulky. (A 40-column portable printer and a 3.5 inch disk drive are available as outboard units for the PX-8.) The two machines are compared in relation to this field data system in Table 1.

The Epson version of the field data system was tried out recently by Mr N.S. Lander, when he made plant collections in New Zealand. He found it quite satisfactory, recording 45 research collections of Olearia and later preparing labels, both primary and duplicate. The specimens are now incorporated in the Herbarium. He was able, incidentally, to make a number of improvements to the two BASIC programs, which I have adopted for the current distribution version. Both Mr Lander and I have used the field data program for re-recording existing handwritten field collecting notes, simply to facilitate label preparation.

3. Character-scoring and analysis.

Being lightweight and compact, compared with a desktop microcomputer, the PX-8 can be brought close to the work when measurements are being made on herbarium specimens in preparation for analysis. The DELTA system (Dallwitz 1984, Partridge & Dallwitz 1986) enables the automatic construction of taxonomic keys and descriptions, given that data are correctly encoded from appropriate plant speciments. The PX-8, though not capable of itself running the DELTA system, has proved useful for initial data recording, following which the data can be simply transferred to the machine running DELTA.

4. Writing.

By installing the plug-in Portable WordStar ROM, the PX-8 can be used for composing drafts of papers for publication and other documents. I have found this process to have about it an informality which seems to aid creative thought, yet avoids the untidiness of repeatedly-altered written drafts. These advantages can of course be gained from the use of any standard word processor, but there are times when inspiration strikes away from the office, when it is advantageous to have the PX-8's portability and independence. Resulting files can later be transferred to a standard office machine if desired, using the Epson's built-in terminal program, or they can be printed out directly. Papers destined for computer typesetting can be easily transferred to a suitable disk format.

5. Program development.

Some of the benefits mentioned above apply to BASIC program-writing, using the PX-8. A particularly handy feature is the ease with which print commands can be directed temporarily to the screen by using the CP/M STAT function to reassign devices. This permits program development work to be carried out away from a printer, without any need to modify the program itself.

Table 1. Comparison of hardware and software features of Sharp PC-1600 pocket computer system and Epson PX-8 laptop computer.

Feature	PC-1600	PX-8
Hardware		
Main memory (kb)	16	64
RAM disk (useable kb)	60	120
Plug in ROMs (number/size in kb)	2/32	-
Screen width (columns)	26	80
depth (lines)	4	8
character height (mm)	4	3.2
Battery type	Alkaline	Ni-Cad
Keyboard width Q to P (mm)	108	170
width space bar (mm)	20	132
number prog. funct. keys	18	10
shift key type	Held down	Toggled
Integrated peripherals		
Floppy disk (kb per side)	60	-
Cassette tape (kb per side)	-	14
Printer speed (characters/sec.)	8	-
width (columns)	80	
External interfaces		
Audio cassette	Yes	No
Floppy disk drive	No	Yes
Bar code reader	No	Yes
Serial & RS232	Yes	Yes
Software		
WordStar	-	Plug-in ROM
BASIC	Fixed	Plug-in ROM
BASIC Language features		
WAIT (time delay)	Yes	No
File APPEND mode	Yes	No
Maximum undimensioned array (char.)	1	10
Maximum undimensioned string (char.)	16	255
Maximum dimensioned string (char.)	80	255
CHR$ Syntax	CHR$(n) or CHR$n	CHR$(n) only
EDIT command	No	Yes
Command case sensitivity	Capitals	Either
Login password	No	Yes
DATE$ format	mm/dd only	mm/dd/yy + auto day

6. Calculating.

The Epson's full-featured BASIC interpreter permits complex or repetitive calculations to be carried out. As well, simpler or once-only calculations can be made in direct mode, without the need for programming, although this application tends to be limited in taxonomic work and may, in many cases, be more conveniently performed with a hand calculator!

7. Moving data.

The Herbarium employs a quadriplegic who can type flora descriptions on a slightly modified PX-8, producing files on microcassettes which can simply be sent from his sheltered workshop to the Herbarium, where the microcassettes are placed on another PX-8 and the files transferred to the Departmental Prime, on which flora descriptions are stored. We have preferred this method to direct transfer using modems, since microcassettes can be conveniently exchanged when manuscripts are delivered and discussed, and are cheaper.

8. Bar codes.

The PX-8's capacity to read bar codes, via a plug-in wand and special applications software, is relevant to the Western Australian Herbarium's WAHERB data base (Green, Macfarlane & Maslin 1987), since custom-made bar codes are applied as key numbers (unique specimen sheet numbers) at the time of data entry. A separate paper on bar codes has been written by Macfarlane, Green & Maslin (1987). The Epson bar code system has not been tried out here, as we preferred a dedicated bar code reader, but would appear to be a practicable and somewhat cheaper alternative for anyone willing to use their Epson for the purpose.

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THE CENTRAL AUSTRALIAN BLOODWOODS: AN ANSWER TO KLEINIG

D.J. Carr and S.G.M. Carr
5a Arkana Street, Yarralumla, A.C.T. 2600

Your correspondent, D. Kleinig (1986), is of course, entitled to his own views on the bloodwood species of Central Australia, based on a quick trip, armed with a camera and, apparently, an unreceptive mind. We understand that his trade is, that of seed collector. One would expect seed collectors (other than those of the 'get-rich-quick' kind) to be particularly sensitive to variations in form and habit of the plants from which they collect. It would be interesting to learn what provenance of e.g. 'E. eremaea' (his concept) he would choose to fill a seed order; buyers might not be pleased to receive seed of the mountain top mallees, E. nelsonii or E. fordeana. Successful landscape artists, like Marion Blackwell, who use native plants are acutely aware of the heritable differences of form and performance of different provenances, often amounting to speciation. But in the field, environmental influences affect the performance of all species and, especially in harsh conditions of growth, may make field identification difficult. Everyone is aware of difficulties in the determination of species of eucalypts in the field and seed collectors have not hitherto proved to be altogether reliable in this respect. For years, overseas and local orders for seed of E. gracilis from Western Australia were filled with seed of E. ovularis. The two species are superficially alike in the field, but comparatively easy to separate in the laboratory. Even in the herbarium, so-called "competent botanists" often fail in the identification of bloodwood specimens. The trouble arises from the fact that many of them spurn the use of optical systems yielding more than 10-50x magnifications. They utterly neglect the wealth of microscopical information (e.g. whether the leaves are hypostomatous or not) which lies beyond such magnifications, and even the lower mangifications are seldom efficiently used. In addition, naturalists and some botanists would apparently like to imagine that native plants are now so well-described and easy to identify that all one needs is a glossy, coloured "field guide", reminiscent of those which tourists carry to the European alps. The intensive studies of Australian plant genera for the Flora of Australia have revealed how very complex they are, and how very cryptic the differences between species. Animal taxonomists have long recognised the extraordinary degree of adaptive radiative evolution which has gone on in areas such as Central Australia. It would be naive to suppose that a similar evolutionary process has not taken place among the plants of these regions. Only scientific studies undertaken over a period of years are likely to reveal the true complexity of the taxonomy of native plants.

Our published concepts of the Central Australian species rest, in the first place, on the knowledge gathered by botanists like D. Nelson and G. Chippendale resident for years in the area. We are grateful, for instance, to have had Des Nelson as a botanical Virgil to point out to us in the field the variety of local bloodwoods. In many ways, we have merely crystallized the intuitive ideas of resident botanists who have come to know well the plants of their own region. In addition, we have had available for study a large number of specimens from the region collected over decades by such distinguished 'Centralists' as Cleland, Symon, Forde, Nelson, MacConochie etc., in addition to our own collections. From each of these specimens we have made stained

preparations of the leaf cuticles for microscopical examination with a variety of techniques and at the highest available optical magnifications. We have collected data on the features of ornamentation of the cuticles, the presence or absence of oil-gland cap cells etc., and made measurements of, stomatal size and frequency, and the composition of stomatal complexes. Scanning electron micrographs (SEM) have been made of the leaf surfaces of a large number of the specimens, and thin sections from resin-embedded leaves of representative specimens have been made. These sections give an added dimension to those observed by studies of whole cuticles. We elucidated the true nature of E. dichromophloia by such phytoglyphic methods 16 years ago (Carr et al 1971), and we have since published a number of papers illustrating their usefulness, not only in connection with studies of bloodwoods, but also those of other groups of eucalypts (see Carr & Carr 1976, and references in Carr & Carr 1980 & 1985). The microscopical features prove to be far more species-constant than features of gross morphology, which are liable to vary considerably in response to variations in environmental stress. The phytoglyphic methods enable correct identification to be made of stunted, depauperate plants from severe environments (e.g. Heavitree Gap) even when the specimens consist only of leaves. In the same way that the study of microscopical and even sub-microscopical features has revolutionised the taxonomy of grasses, microscopical studies will eventually raise eucalypt taxonomy from a subjective, intuitive art to science.

Where flower buds are available, cleared preparations of the style and stamens have been examined microscopically. Fruits have been studied, often in section, with a dissecting microscope and measurements made of a variety of features. Wherever possible (i.e. in all cases in the Central Australian species) we have raised seedlings from seed on the specimens themselves (some of them rather old) and these have also been subject to minute scrutiny and comparison. Using all the data collected by such examinations, the specimens have been assembled into groups with features in common. It is gratifying that these groups fulfil sensible expectations of similarities of gross form, of habitat preferences (where these are recorded), seedling character and of geographical distribution. Not until the specimens have been assembled in such groups, and certainty reached that each group constitutes a distinct and recognisable entity, have we proceeded to name and describe it. Sets of specimens of these species are available in a number of State herbaria with which other specimens may be matched.

The work involved has amounted to at least 3 person-days per specimen and the number of specimens examined for Eucalyptus I (Carr & Carr 1985) ran into several hundreds. A wrong impression may have been given by the small number of specimens cited in Eucalyptus I as representative of each species. That will be rectified for the species to be described in Eucalyptus II (Carr & Carr in press). As a consequence of this work, we have accumulated dozens of boxes of microscope slides, dozens of photograph albums containing SEM Polaroids, hundreds of 35mm photographs, hundreds of seedlings and of course a vast amount of raw data, far too voluminous to publish, to back up our descriptions. What has Mr. Kleinig to show to back up his opinions? We are aware of only two specimens brought back from his trip so that his claims might be tested. Both were from far western New South Wales and although labelled 'centralis' by Kleinig, both clearly fit the description we gave of 'orientalis'. He visited the remote Mt. Connor, which is very much under-collected as far as eucalypts are concerned, despite his claim that it

"excites botanical collectors", without bringing back any specimens to support his view that "there is only one bloodwood species on the mountain". It would be interesting to know how long he spent there and what fraction of the extensive mountain top he covered. Our detailed, scientific investigation of the Central Australian bloodwoods took many years to complete. Its results will stand, despite Kleinig's curt dismissal of them. Eventually botanists and ecologists resident in the Centre will study the species even more intensively in the field. Such studies should also involve trees of the species raised under good conditions in a Botanical Garden. Experiments of this kind were begun by Clyde Dunlop when he was stationed in Alice Springs. He was convinced of the heterogeneity of bloodwoods at Heavitree Gap. Unfortunately, he moved to Darwin before the results could be gathered. As a result of such studies, a clearer understanding of the biology, ecological preferences and distribution of each of the species will be reached and eventually that in turn may make it easier for the visiting botanist to identify them.

Mr Kleinig appears a priori to proceed from the naive, and certainly wrong, assumption that, in a given locality (e.g. at Heavitree Gap, Trephina Gorge and Mt Conner) there can only be one species of bloodwood. As to the "manuscript name" (for E. lenziana) "given by other taxonomists" we are aware only of two different names given by Kleinig's co-author (I. Brooker) to two different Western Australian specimens of that species. Evidently their author had very little understanding of the connection, either between his own two specimens or of their relationship to the Central Australian specimens collected by others.

Finally, Kleinig's closing remarks about refereeing are quite unwarranted. As is explicitly stated in the Preface, the m/s was submitted to Mr. A.S. George. Suggestions for improvement were incorporated in the book. We can think of no more competent or able referee in Australia.

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REPORTS

MELBOURNE CHAPTER PROGRAM - 1987

Meetings are at 6.00 p.m. on the First Thursday of the month, at the National Herbarium of Victoria, Birdwood Ave, South Yarra, unless otherwise advertised.

Thursday, March 5th 6.00 p.m.	"Keys, identification and computers in plant taxonomy" - Dr Trevor Whiffin (LTU)
Thursday, April 2nd 6.00 p.m.	"Higher level relationships in the lilies (Liliflorae)" - Dr John Conran (MONU)
Thursday, May 7th 6.00 p.m.	"This is Angophora" - Kevin Thiele (MELU)
Thursday, June 4th 6.00 p.m.	"Use of cladistics in biogeography - an introduction" - Dr Pauline Ladiges (MELU)
Thursday, July 2nd 6.00 p.m.	"Why Botanic Gardens?" - Michael Looker/John Taylor (Royal Botanic Gardens)
Thursday, August 6th 6.00 p.m.	"Soil and vegetation relationships in Western Victoria" - Frank Gibbons (formerly SCA)
Thursday, Sept. 3rd 6.00 p.m.	"Evolution of Australian Inuleae (Compositae)" - Dr Philip Short (MEL)
Thursday, Oct. 1st 6.00 p.m.	"The earliest Angiosperms in south-eastern Australia - their development, affiliations and fossil record" - Dr Jack Douglas (DITR)
Thursday, Nov. 5th 6.00 p.m.	"The phytogeography of Australian bryophytes - facts, fiction and fantasy" - Dr George Scott (Queen's College - MELU)
November - date to be announced	Excursion 'The Garden of St Erth', Blackwood - T.R. Garnett
Thursday, Dec. 3rd 6.00 p.m.	To be announced

Visitors Welcome. Enquiries to: Stephen Forbes, David Albrecht or Philip Short. Ph: 63 9424.

MELBOURNE CHAPTER NOTES

Barry Conn has taken a position at NSW. Barry's (relatively) short stay at MEL was influential in reshaping curatorial policy and institutional objectives. As well as professional ability, Barry's straightforwardness and helpfulness were greatly valued. It is hoped that this loan will return to MEL in due course.

Ray Smith has retired after 42 years at MEL. Ray's identification skills, especially with sterile specimens, are always in demand. Ray's patience and thoroughness allowed resolution of seemingly insoluble problems. Fortunately Ray's retirement is in name only and Ray still provides a backup to MEL staff 4 days a week. The incorporation of Ray's excellent collections is eagerly anticipated.

The first two Melbourne Chapter meetings for 1987 were well attended. Dr Trevor Whiffin (LTU) gave an excellent introduction to the use of computer keys in plant taxonomy. TROPIFAM, MEKA and MEKAEDIT from Duncan & Meacham (see Taxon 35:492-494, 1986) were demonstrated. Trevor also demonstrated the computer key to Queensland rainforest species currently being prepared with Bernie Hyland.

John Conran (MONU) discussed Higher level relationships in the lilies (Liliflorae). Analyses using phenetic and cladistic methods lent support to Dahlgren and Clifford's treatment of the net-veined Liliflorae.

ASBS members concerned about Mueller's grave at St. Kilda will be pleased to know that Gianarelli & Sons restored the tomb in 1985. Regilding the epitaph, stone tuck-pointing and refurbishing the iron railings were the main work (see Trust News (Victoria) 13/7:7 (1985)). ASBS Melbourne Chapter drew the attention of the Maud Gibson Trust to the deteriorating monument. The Maud Gibson Trust, in turn, contacted the National Trust for whom Gianarelli offered their services in celebration of Victoria's sesquicentenary.

Stephen Forbes - Convenor

ABRS REPORT

Flora of Australia Volume 45 (Hydatellaceae to Liliaceae) was published on 15 May, 1987. It is the eighth volume and brings the coverage of the flora to 70 families 461 genera 2,111 species and 435 infra specifics. Although the most expensive volume to date, it is also the largest. It has already attracted very favourable comments.

Due to an oversight there are errors in the labelling of two figures which is worth clarifying here. Figure 59 (p. 174) of Neoastelia spectabilis : the lettering was left off. It is as follows, starting at the top of the plate and working left to right: "A" is the top illustration; then "B", "E" and "D" in the next row; below "E" is "C"; "H" is in the lower left corner; "F" is above the two black seeds which are "J" and "K"; "G" is next to the right; and "I" is in the lower right corner. Figure 118 (p. 399) Wurmbea centralis : the illustration immediately below "F" is unlabelled and should be "H", the one immediately below "G" should be "I". The illustration at the centre, bottom row, already labelled "H" should be changed to "J" and the one to the right labelled "I" should be changed to "K".

Volumes 19 (eucalypts), 3 (Moraceae/Urticaceae/Casuarinaceae etc), 18 (Thymelaeaceae etc) and 49 + 50 (oceanic islands) have progressed very well in the last 6 months. We appear likely to be able to maintain a publication rate of 1 volume per year. Our work has noticeably accelerated when clear, clean manuscript has been received from authors.

The Census of Australian Plants is being edited following a tremendous response from many people. The level of changes is very much greater than anticipated and has put back the completion of version 1 by at least 6 months.

The second edition of the Flora of Australia Guide for Contributors has also been published. Copies will be distributed to all herbaria and current contributors.

R.J. Hnatiuk, Canberra.

PUBLICATIONS

RECENT PUBLICATIONS OF INTEREST

Wildflowers of Kakadu Kym Brennan. Brennan. $10.50

Weeds: An Illustrated Botanical Guide to the Weeds of Australia B.A. Auld & R.W. Medd. Inkata. $65.00

Encyclopaedia of Ferns D.L. Jones. Lothian. $100.00

Trees & Shrubs in Rainforests of New South Wales and Southern Queensland J.B. Williams, G.J. Harden & W.J.F. McDonald. UNE. $10.00

Australian Daisies Aust. Daisy Study Group. Lothian. $24.95

Dendrobium Orchids of Australia W. Upton. Dent. $60.00

Toxic Plants & Animals: A Guide for Australia J. Covacevich, P. Davie & J. Pearn (eds). Qld Museum. $28.00

Forest Soils and Nutrient Cycles P. Attiwill & G. Leeper. Melb. Uni. Press $29.90

Flora of Australia Volume 45: Hydatellaceae to Liliaceae. AGPS. $54.95

FLORA OF THE PERTH REGION, N.G.Marchant, J.R.Wheeler, B.L.Rye, E.M.Bennett, N.S.Lander & T.D.Macfarlane. Western Australian Herbarium, Perth. 1987.

The Flora of the Perth Region published in two volumes is now available. If it is not available at your bookseller it can be bought direct from Department of Agriculture, Baron-Hay Court, South Perth, 6151, Western Australia. The cost is $45 plus $10 for postage and packing.

The cover features a beautiful painting of Grevillea bipinnatifida by Margaret Menadue. Margaret Stone (Kew) has written saying :- "I was at U. C. Davis (USA) the other month and came on the leaflet advertising the Flora of the Perth Region with a wonderful illustration of a Grevillea by Margaret Menadue. It is always very exciting to see a really good botanical illustration by a living artist." The 317 line drawings are also by Margaret Menadue.

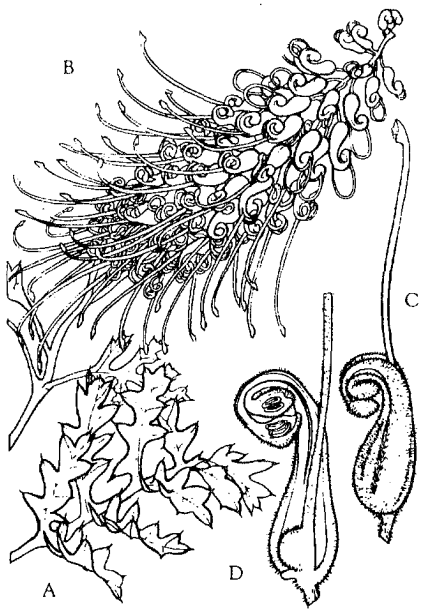

Fig. 109. *Grevillea bipinnatifida*. **A**. Leaf. **B**. Raceme. **C**. Flower. **D**. Longitudinal section of flower with part of style removed.

NOTE RE THE EUROPEAN GARDEN FLORA

Volume 2 of The European Garden Flora - Monocotyledons (Part 2): Juncaceae to Orchidaceae was published in 1984. The manuscript for this Volume was ready first so it went off to the press without delay! It is available for 32.50 English pounds. Volume 3 is almost ready for press - the whole of the Cactaceae is complete (some 720 odd species).

Peter Green, Kew.

Volume 1 is available for 55.00 English pounds. Perhaps ordering direct from Cambridge University Press might be cheaper for Australians. The address is:- Cambridge University Press, The Edinburgh Building, Shaftesbury Road, Cambridge CB2 2RU, United Kingdom.

STOP PRESS

PROBLEMS WITH THE DISTRIBUTION OF ASBS Newsletter No 50

Some problems with the print out of address labels may have resulted in you not receiving your copy of No 50. As a result I would ask everyone to do two things: -

1. check that they have received their copy, and
2. check the address on this copy.

Please write to the Treasurer or the Editor to have errors and ommissions corrected.

Helen Hewson, Canberra.

UNFINANCIAL ???

Members who are unfinancial are requested to pay their subscriptions. Those who have not paid since 1984 have been automatically struck off. Those who have not paid since 1985 will be automatically struck off if their subscriptions are not paid up by the end of August.

D.Foreman & H.Hewson

The Society

The Society is an 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 and entitles the member to attend general and chapter meetings and to receive the Newsletter. Any person may become a member by forwarding the annual subscription to the Treasurer. Subscriptions become due on the 1st January.

The Newsletter

The Newsletter appears quarterly and 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 pages in length) will be published. Contributions should be sent to the Editor at the address given below, preferably typed in duplicate and double-spaced. All items incorporated in the Newsletter will be duely acknowledged. Authors are alone responsible for the views expressed.

Notes

- ☐ The deadline for contributions is the last day of February, May, August and November.
- ☐ ASBS Annual Membership is $16 (Aust.) if paid by 31st March, $20 thereafter. Students (full-time) $12. Please remit to the Treasurer.
- ☐ Advertising space is available for products or services of interest to ASBS members. Current rate is $30 per full page. Contact the Newsletter Editor for further information.
- ☐ All address changes should be sent to the Treasurer or the Editor.

Editor et al.

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