

ECOLOGY OF WEST ANATOLIAN LIVERWORTS

by Münir Öztürk and Isa Gökler

The Asiatic part of Turkey, commonly known as Anatolia, comprises 751,100 km² and is separated from the European part by the Bosphorus. Most of Anatolia is a plateau, rising steadily towards the East being bounded in the North and the South by steep mountain ranges. The climatic, geological and geographical contrasts have resulted in a very rich flora, which has attracted the attention of many botanists, including P. H. Davis, who has published 9 volumes of the "Flora of Turkey and East Aegean Islands", (Davis, 1946-86). A perusal of these volumes reveals little about the bryophytes of the region.

For information about bryophytes one should consult the papers by Juratzka and Milde (1870); Schiffner (1896, 1897, 1908, 1913); Penther & Zederbauer (1905); Reimers (1927); Bornmüller (1931); Bizot (1955); Henderson & Muirhead (1955); Henderson (1957, 1958, 1961, 1963); Jovet-Ast (1957); Fröhlich (1959); Robinson & Godfrey (1960); Walther (1967, 1970); Walther & Leblebici (1969); Townsend (1969); Henderson & Prentice (1969); Crundwell & Nyholm (1979); Gökler et al. (1984); Çetin & Yurdakulol (1958, 1986); Gökler & Öztürk (1986); Gökler (1986).

Most of these workers have concentrated their studies on the West Anatolian part of Turkey, between 36° - 41° North latitude and 26° - 30° East longitude, covering grid squares 6 and 11 (Henderson, 1961). In general this area enjoys a mediterranean climate, with hot dry summers and mild rainy winters; however, much variation in

climatic parameters are met with in the area due to its varied topography. Thus Bodrum at the sea coast shows a mean annual temperature of 18.7° C and rainfall of 511 mm, whereas nearby Mugla experiences a mean annual rainfall of 759 mm and a mean temperature of 14.8° C. At increasing altitude and distance from the coast, climatic changes become stronger due to the presence of mountains up to ca. 2500 m high and big rivers such as the Gediz, Big Menders, Small Menders and Bakir. While Izmir has an annual mean temperature of 17.5° C and a rainfall of 520 mm, Usak in the East has a mean temperature of 12.0° C and a mean rainfall of 398 mm per year.

Up to 1982, 131 species of liverworts had been recorded from Turkey. *Pellia neesiana*, *Porella thuja* and *Mylia taylori* were added by Gökler et al. (1984), Gökler & Öztürk (1987) and Çetin & Yurdakulol (1986), raising the number to 134. Our latest findings have shown that 67 species belonging to 24 families occur in the Anatolian region. This number appears to be quite low compared to Europe. The main reason for this is that very few investigators have visited this area and mostly only for a limited period. In view of the fact that about 10,000 species of higher plants are recorded from Turkey, with an endemism ratio of 1/3, a much larger number of species of liverworts is expected to occur in this region.

Among the liverwort families found in West Anatolia, the Ricciaceae are the most prominent with 11 species of *Riccia* being known: *Riccia bicarinata*, *R. ciliata*, *R. ciliifera*, *R. crystallina*, *R. glauca*, *R. gougetina*,

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On Retroactivity

by Gea Zijlstra

In an earlier column (Bryol. Times, 46: 5) a survey was given of some important decisions, taken in the Nomenclature Section of the XIV IBC, Berlin 1987. It has been mentioned already that retroactivity was an important theme on which decisions have been postponed, through the establishment of a Special Committee on Retroactivity, Superfluity and Illegitimacy, to report to the XV IBC. Almost all proposals concerning retroactivity have been referred to this committee.

The immediate cause was uncertainty about the best answer to the question "Is lectotypification retroactive?". Another subject that in my opinion should be studied by this committee relates to the retroactivity of Appendices II and III of the Code.

Retroactivity of lectotypification

This topic has been the subject of many discussions already. An example from bryology is *Omphalejeunea*, of the the very few Sprucean subgeneric epithets that was not raised to generic rank by Schiffner in 1893, although Lacouture did so in 1908. Spruce in 1884 in his *Lejeunea* subg. *Omphalejeunea* included *Omphalanthus* Lindenb. et Nees, 1845 p.p. This genus originally comprised 87 species; Schiffner in 1893 retained it with *O. filiformis*, one (of the original) species only. This has always been considered as a lectotypification. (Following Berlin I am not sure if this

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A contribution to the Phytogeography and Ecology column edited by S. R. Gradstein and J. Vána.

A contribution to the Nomenclature Column edited by G. Zijlstra, Institute of Systematic Botany, Utrecht, The Netherlands.

West Anatolian Liverworts

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R. macrocarpa, *R. michelii*, *R. nigrella*, *R. rhenana* and *R. sorocarpa*. The Ricciaceae is followed by the Epigonanthaceae (Jungermanniaceae s. l.) with a ratio of 11.94%. It is comprised of 6 genera with 8 species namely: *Barbilophozia barbata*, *B. hacheri*, *Gongylanthus ericetorum*, *Jungermannia crenulata*, *Leicolea turbinata*, *Lophozia excisa*, *Southbya nigrella* and *S. stillicidiorum*. Other important families are the Porellaceae (*Porella baueri*, *P. cordaeana*, *P. laevigata*, *P. platyphylla* and *P. thuja*), the Cephaloziellaceae (*Cephaloziella baumgartneri*, *C. divaricata*, *C. hampeana* and *C. stellulifera*), and the Codoniaceae (*Fossombronia angulosa*, *F. caespitiformis*, *F. pusilla* and *Petalophyllum ralfsii*). The remaining families usually have less than four species in the area.

In Western Anatolia, liverworts grow mainly in humid and shady places. Some species are restricted to very particular habitats, e.g. (i) on arable garden soil and in greenhouses: *Lunularia cruciata*, *Marchantia polymorpha*, *Phaeoceros laevis*, *Riccia glauca* and *R. sorocarpa*; (ii) on neutral or weakly acidic woodland soils: *Anthoceros punctatus*, *Cephaloziella hampeana*, *C. stellulifera*, *Fossombronia angulosa*, *F. pusilla*, *Jungermannia crenulata*, *Pellia epiphylla*, *Phaeoceros dichotomus* and *P. laevis*; (iii) on calcareous rocks: *Grimaldia dichotoma*, *Metzgeria furcata*, *Plagiochasma rupestre*, *Plagiochila porelloides*, *Porella laevigata*, *P. platyphylla* and *Targionia hypophylla*; (iv) on wet rocks along mountain streams: *Chiloscyphus polyanthos*, *Conocephalum conicum*, *Lejeunea canifolia*, *Pellia endiviifolia*, *Riccardia sinuata*, and *Scapania undulata*; (v) in wet rock clefts and on slopes: *Frullania tamarisci*, *Metzgeria conjugata*, *Pellia epiphylla*, *Plagiochila porelloides*, *Porella cordaeana*, *P. thuja*, *Radula complanata*, *Reboulia hemisphaerica*, and *Scapania compacta*; (vi) on deciduous lowland trees: *Frullania dilatata*, *F. tamarisci*, *Porella baueri*, *Porella platyphylla*, and *Radula complanata*; (vii) on wood and decaying logs: *Lophocolea cuspidata*, and *L. heterophylla*; (viii) marshy meadows: *Chiloscyphus polyanthos*, *Pellia endiviifolia*, and *P. neesiana*.

The majority of West Anatolian liverworts never form pure

communities, but grow in mixed associations. Factors which play a role in the frequency and number of liverwort associations occurring in the area are moisture, shadiness, temperature, altitude and slope. The external morphology of the species is important too because leafy hepatics are normally more sensitive to dessication than thallose species. In habitats where water is available all the year around, as by stream banks and springs, the associations seem to be present continuously. Where habitats are only periodically wet, e.g. on rocky walls and tree trunks, the associations loose their vitality with the loss of moisture, resulting in discontinuous species distributions.

The most abundant associations met with in West Anatolia are the *Pellia endiviifolia*-*Leicolea turbinata* association and the *P. endiviifolia*-*Hygroamblystegium tenax* association. At some sites, between 450-800 m alt., *Platyhypnidium riparioides* and *Hygroamblystegium fluviatile* are found together with these associations. Their habitats dry out during June-October, causing virtual disappearance of the associations. However, they reappear with the onset of rains in autumn. The other water-sensitive association is the *Conocephalum conicum*-*Mniobryum delicatulum* association, found during October-May together with *Mnium undulatum* and *Oxyrrhynchium swartzii*. This association is found from an altitude of 400 m up to the upper limits of the mountains, being resistant to frost.

Another common association in the region is the *Targionia hypophylla*-*Funaria calcarea* association. It is not sensitive to altitude and shadiness and occurs all through the year, except during July and August. Other members of the association are *Encalypta vulgaris*, *Scorpiurum circinatum* and *Barbula vinealis*. The *Lunularia cruciata*-*Porella cordeana* association is distributed between 700-900 m together with such species as *Oxyrrhynchium swartzii*, *Pellia endiviifolia* and *Brachythecium rutabulum*, being sensitive to dry periods. The *Metzgeria furcata*-*Fabronia pusilla* association too is like the former one and is accompanied by *Porella cordaeana*, *Pterogonium gracile* and *Homalothecium sericeum*.

In wet habitats from 500-800 m the *Lophocolea heterophylla*-

Brachythecium rutabulum association is found along with *Hypnum cupressiforme* and *Bryum capillare*. The most sensitive species are *Plagiochila porelloides* and *Radula complanata*, which commonly occur as pure stands.

In conclusion we can say that there is a great need to fill gaps in our knowledge of the liverwort flora of West Anatolia and of Turkey as a whole. Also the ecology of the liverwort species in the area is still only incompletely known.

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can be retained since Schiffner did not use the word 'type'; but for simplicity of this example let us take Schiffner's action to constitute lectotypification). Those who consider lectotypification to be retroactive, would argue that *Omphalolejeunea* is an illegitimate substitute name for *Omphalanthus*. Spruce included *Omphalanthus* p.p. only, but he did include its lectotype, *O. filiformis*.

In Index Nominum Genericorum lectotypification is always considered to be retroactive. At the generic level this kind of case can be detected in ING from the words "(by lectotypification)", e.g. for *Omphalolejeunea*: "≡ *Omphalanthus* Lindenberg et Nees 1845 (by lectotypification)". This implies that the 1893 lectotypification is taken as working retroactively to 1884, when Spruce published his subgenus. In other words, it is taken as if Spruce should have known already that he was including the type of *Omphalanthus*. (In ING the "(by lectotypification)" is added, because a lectotypification later on can be proved to have been wrong. If this appears to be the case, of

course, the illegitimacy (≡) is removed.)

Those who consider lectotypification not to be retroactive, would argue that *Omphalolejeunea* needs a lectotype, and an author may well have indicated one of the species that Spruce added to the taxon concerned. Happily in the case of *Omphalolejeunea*, this problem does not exist as Bonner et al. in 1961 indicated *O. filiformis*.

Retroactivity of Appendices II and III of the Code

This concerns names that were illegitimate when published but, for various reasons, for a long time or even always have been in use. An example from the orchids: *Goodyera* R. Brown 1913 was published with two species: *G. repens* and *G. pubescens*; *G. repens* was based on *Satyrium repens* L. 1753. The latter was the only species, included by Séguier 1754 in his n.g. *Epipactis*. This genus has been neglected since then, until the sixties of this century, when it was added as a nom. rej. against *Epipactis* Zinn 1757, nom. cons. (The latter had been conserved already for several decades a.o. against *Helleborine* Miller, 1754.)

Nobody ever raised the problem that *Goodyera* was illegitimate WHEN PUBLISHED (under a certain interpretation of Art. 63), but the Sydney addition in Art. 6.4 ("A name which according to this Code was illegitimate when published cannot become legitimate later unless it is conserved") certainly presents a threat to the status of this category of names. Even though the Sydney addition had been made under the argument that it was not the intention to introduce any change.

Dandy (1967) had no problem in adding "≡ *Goodyera* R. Br. 1813" as the name to be used for the newly detected *Epipactis* Séguier. If we can consider App. II to be retroactive, there is no problem indeed: then *Goodyera* can be considered as legitimate when published.

"Berlin" has not been consistent with proposals about this question: Prop. F. to Art.6, designed for this kind of case at the generic level, was rejected; Prop. G, designed for infrafamilial names, was accepted;

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On Retroactivity (continued from p. 3)

Prop. H, not restricted to any rank, was rejected again. The main reason to accept G and reject F, seems to be that the proposer (Nicolson) changed his mind, and was still in favour of G, but not any longer of F.

If you come across a case in which you conclude either that it is quite convenient to accept retroactivity, or to reject it, please let me know. I will be a member of that committee, and I

think we need many examples.

The committee will also study the connection between Art. 7.11 and Art. 63.

Reference

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All other positively identifiable Tertiary fossils of hepatics are from amber. In the main the latter are outstandingly well preserved but, unaccountably, have long been neglected. A recent revision of such specimens by the author has brought several new records to light. The present state of knowledge is set out in Table 1.

Unexpected results that emerged from this re-examination of the Tertiary fossils include the detection of

BRYOPHYTE FOSSILS IN AMBER

By
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A major reason for the deplorable uncertainty of bryophytic phylogeny, and hence of the taxonomic arrangement of bryophytes, is the great rarity of fossils (see Krassilov & Schuster, 1984 for review). In addition, most fossils are very poorly preserved. This is equally true for both hepatics and mosses. Reflecting the author's more extensive knowledge of the former group, this account is restricted to fossil hepatics and especially focuses attention on specimens preserved in amber (Grolle, 1981c).

Among the few examples of structurally, rather well-preserved hepatics from the Palaeozoic are: *Pallaviciniites devonicus* (Hueber) Schust., 1966 (Devonian: N. America); *Hepaticites kidstonii* Walton, 1925 (Carboniferous: Scotland); *Blasiites lobatus* (Walton) Schust., 1966 (Carboniferous: Scotland) and *Gessella communis* Poulsen, 1974 (Permian; Denmark). Those from the Mesozoic are even scarcer: *Diettertia* Brown et Robinson, 1974 (Cretaceous: N. America); *Naiadita lanceolata* Brodie (Jurassic: S. England, Harris, 1939); *Metzgeriites glebosus* (Harris) Steere, 1947 (Jurassic: Britain); and *Sporangioceros nipanicus* Sharma et al., 1984 (Jurassic: India, Sharma & Suthar, 1986). Surprisingly the fossil records of well-preserved hepatics from the Tertiary are especially scanty. There are some Tertiary spores which have been identified as hepatics, e.g. *Anthocerisporis* Krutzsch, 1967; *Bohemiasporis* Krutzsch, 1967; *Saxosporis* Krutzsch, 1963; and *Zlivisporis* Pacltova, 1961.

EUROPEAN origin

	Baltic amber	Saxonian amber
<i>Bazzania polyodus</i> (Caspary, 1887) Grolle, 198	!	
<i>Calypogeia stenzeliana</i> Grolle, 1985a		!
<i>Cephaloziella dimorpha</i> (Caspary, 1887) Grolle, 1980	! m	(!)
<i>Cheilolejeunea latiloba</i> (Caspary, 1887) Grolle, 1984a	!	! f
<i>Frullania acutata</i> Caspary, 1887, Grolle 1981b, 1985c	!	
<i>Frullania baltica</i> Grolle, 1985c	!	
<i>Frullania casparyi</i> Grolle, 1985c	!	(!)
<i>Frullania schumannii</i> (Caspary, 1887) Grolle, 1981a, 1985c	! m+f	
<i>Frullania truncata</i> Caspary, 1887, 1907, Grolle, 1985c	!	
<i>Frullania varians</i> Caspary, 1887, 1907, Grolle, 1985c	! m +per	(!)
<i>Jungermannia berendtii</i> Grolle, 1980	!	
<i>Lejeunea alifera</i> Caspary, 1907, Grolle, 1985b	!	
<i>Nipponolejeunea europaea</i> Grolle, 1981b	!	
<i>Radula bitterfeldensis</i> Grolle, 1985a		!
<i>Radula oblongifolia</i> Caspary, 1887, 1907	!	(!)
<i>Radula sphaerocarpoides</i> Grolle, 1980	!	(!)
<i>Spruceanthus polonicus</i> Grolle, 1985b	! f	
<i>Trocholejeunea contorta</i> (Göppert et Berendt, 1845) Gradst. et Grolle In Grolle, 1982	!	(! per.)

NEOTROPICAL origin

	Dominican amber	Mexican amber
<i>Bazzania oleosa</i> Grolle In Grolle & Braune, 1988	!	
<i>Bryopteris succinea</i> Grolle, 1984c	! m	
<i>Cyclolejeunea archaica</i> Grolle, 1984c	! (f)	
<i>Cyrtolejeunea suzannensis</i> Grolle, 1984b	!	
(<i>Drepanolejeunea</i> sp.)	(!)	
(<i>Frullania</i> sp.)	(!)	
<i>Lejeunea palaeomexicana</i> Grolle, 1985d		!
(<i>Lejeunea</i> sp.)	(!)	
<i>Leucolejeunea antiqua</i> Grolle, 1983	! (m+per.)	
<i>Prionolejeunea</i> sp. 1986	!	
<i>Radula steerei</i> Grolle, 1987	!	
(<i>Stictolejeunea</i> sp.)	(!)	

Table 1. Hepatics so far identified from amber (all from the Tertiary). ! = verified record; m = male gametoeonium; f = female gametoeonium; per. = perianth; () = unpublished.

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Fossils in Amber

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European fossil species of *Cheilelejeunea* (Spruce) Schiffn., *Nipponolejeunea* Hatt., *Spruceanthus* Verd. and *Trocholejeunea* Schiffn., all genera nowadays lacking in Europe and the latter three with their extant range restricted to eastern Asia. Also well-preserved oil-bodies were found in *Bazzania oleosa* from Dominican amber 20 million years old.

Apparently there is still an appreciable number of undescribed fossil hepatics hidden in amber. Large quantities of amber are available on the commercial market, especially of Dominican origin. Most of these specimens disappear from science into amber collections of owners lacking any knowledge of bryophytes. The author suggests that bryologists should look for bryophytes in amber and save them for science.

Finally I would like to record my very best thanks to Prof. J. G. Duckett and Dr. R. Mues for assistance in the presentation of this manuscript.

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- Friedrich-Schiller-Universität, Sektion Biologie, Jena, 6900, German Democratic Republic.

OUT AND ABOUT IN SOUTHEAST ASIA

by
Benito Tan

There has not been much recent locally-based bryological activity in Southeast Asia for four reasons: i) there are few resident bryologists; ii) there is a lack of reference or historical collections, especially types, in local herbaria; iii) there is limited access to a good library; and iv) there is no government support or public appreciation of the value of bryology. In spite of these difficulties, regional bryologists have made some progress in recent years.

Dr Haji Mohamed of the University of Malaya, with the collaboration of Dr B. Tan, has just completed an updated checklist of mosses for Peninsular Malaya and Singapore (*Bryologist*, 91(1): 24-44, 1988). Earlier Dr Mohamed had published a revision of Malaysian *Campylopus* (with Dr J.-P. Frahm) and *Fissidens* (with Dr Z. Iwatsuki). Again, with Dr B. Tan, he is preparing a manuscript on new records of Malaysian mosses.

Dr Benito Tan of the University of the Philippines at Los Baños has, likewise, been active in the study of Philippine mosses. He is currently on a one-year research leave from his University to visit and examine Philippine moss collections at some of the major herbaria of the world. Already he has spent five months at the New York Botanical Garden studying Philippine Sematophyllaceae with Dr W. Buck, and three months at the U.S. National Herbarium, Washington, D.C., completing a revision of Philippine Hookeriaceae with Dr H. Robinson. Dr Tan is at the moment visiting the Brotherus Herbarium, University of Helsinki in Finland to study Philippine taxa of *Acroporium*, *Chaetomitrium* and *Macromitrium* with Dr T. Koponen. Last Spring, he was at the Botanical Museum in Berlin (West), under the sponsorship of DAAD, helping to identify the BRYOTROP moss collections from Mt. Kinabalu, especially the *Dicranoloma*.

Equally important to mention are the latest contributions of European colleagues to south-east Asian bryology. Mr A. Eddy of the British Museum has just published the first volume of his long awaited *Handbook* (continued on p.6)

Out and about S.E. Asia

(Continued from last page)
of Malesian mosses, which covers the Sphagnales, Polytrichales and Dicranales. When completed, the Handbook will prove to be an important reference work for students of south-east Asian mosses.

Last year, Dr A. Touw of Leiden published his revision of *Pogonatum* and related genera for Malesia and Oceania. This year he has started preparing a checklist for the many islands of Indonesia, excluding Borneo. A similar checklist for the mosses of New Guinea has long been completed by Dr T. Koponen of Helsinki, and is only awaiting a publication date. Together, all these updated checklists will form the basis for a better understanding of the bryogeography of the region.

The German BRYOTROP Project, which is based in Berlin (West), in 1986 brought back large collections of bryophytes from Mt. Kinabalu in north Borneo. The identification of these specimens is now nearing completion. Under the co-ordination of Dr W. Schultze-Motel and Mr M. Menzel, the results of the study made by the participating bryologists are expected in September this year, and should be published together in a single volume not later than 1989. Already there are reports of several new records of mosses for Borneo.

Not to be overlooked is the group at the University of Helsinki working on Papua New Guinea mosses under the leadership of Dr T. Koponen. Their publications so far on this subject have recently been enumerated in these columns (see Bryol. Times, 43: 1, 3-4. To date they have discovered many new synonyms among the several moss taxa previously known only from either the eastern or western province of Malesia.

As to the regional hepatic flora, a new checklist for the Philippines has been published by Drs B. Tan and J. Engel of the Field Museum (Chicago) (J. Hatt. Bot. Lab., 60: 283-355, 1986). A similarly useful checklist was published earlier by Drs R. Grolle and S. Piippo for Western Melanesia (Acta Bot. Fenn., 125: 1-86, 1984). One also welcomes the new publications of Dr R. Grolle on several local thalloid hepatics, the contributions of Dr S. Piippo on the Lejeuneaceae and

XIV INTERNATIONAL BOTANICAL CONGRESS BERLIN, JULY- AUGUST 1987

by
Patricia Selkirk

The Methods Workshop in Mainz was immediately followed by the XIV Botanical Congress in Berlin. The huge scale of the Congress made a very striking contrast to the smaller forum of the Workshop. With some 4500 participants and multitudes of interesting-looking concurrent symposia and poster sessions daily, there was no choice but to be highly selective about which talks to attend, which posters to read, and which sessions to skip altogether in favour of useful and interesting chatter with overseas colleagues rarely seen except at conferences. The venue for the Congress, the International Congress Centre, a vast new building which accommodated the entire Congress, made slipping away between sessions simple. The ever-available coffee and plentiful supply of armchairs and tables made gossiping between (or instead of!) sessions pleasant.

In the bryological line there were symposia on generic concepts in bryophyte taxonomy, life strategies of bryophytes in arid areas and in tropical rainforests, cytotaxonomy, ultrastructure and chemosystematics of bryo-phytes and a bryophyte poster session. In addition papers principally concerning bryophytes were delivered in a number of symposia including those on the Antarctic environment, cryptogam physiology, sieve elements, translocation of assimilates and developmental biology of non-vascular plants. Posters principally concerning bryophytes were presented in several

Lepidoziaceae, and the many important studies of other hepatic genera by the Japanese colleagues headed by Drs S. Hattori and H. Inoue.

We continue to have to rely heavily on non-resident bryologists who are currently the most active workers of the Malesian hepatic flora. Maybe future endeavors should try to encourage, as a priority, the training of southeast Asian hepaticologists.

c/o ALCON, 629 T. Alonzo Street,
Sta. Cruz, Manila, The Philippines.

sessions including those on developmental biology of non-vascular plants and mountain and arctic areas.

Fitted in somehow amongst these symposia and sessions were two "Special Interest Group" meetings on bryological topics, i.e. on tropical bryophyte taxonomy and floristics of the Pacific; and bryological bibliographic databases and the Directory project. There was also an I.A.B. business meeting and a bryological dinner.

All in all, the Congress proved to be a most stimulating nine days, not only bryologically but also botanically. Berlin is a fascinating city with lots of wonderfully attractive parkland, and a world famous Botanical Garden and Museum. Unfortunately the City and its sights could only be explored all too sketchily by diligent Congress-attenders.

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BRYOLOGICAL METHODS WORKSHOP - 1987

Mainz, Federal Republic of
Germany
by

Alison Davidson and C. Miles

The first Bryological Methods Workshop under the auspices of the International Association of Bryologists started promptly at 08.30 hours on Saturday 18th July. Some 80 participants from 17 countries gathered in the main lecture hall of the Institute für Allgemeine Botanik at the University of Mainz to hear Professor E. Hartmann open the proceedings with a few words of welcome. Dr Janice Glime also greeted participants and, as madam chairman, thanked the members of the organizing committee: Elmar Hartmann, Hans Rudolph and Zennoske Iwatsuki for their help. Dr Rudolph was credited with the original idea of a bryological methods workshop: what an innovation it would prove to be in the four days of presentations that followed!

The opening addresses were kept short and hence the first session Culture, Development and Genetics

(continued on p. 7)

Bryological Methods Workshop

(continued from p.6)

commenced ahead of schedule. Papers were given by:

D. Basile - Procedures used for the axenic culture and experimental treatment of bryophytes.

H. Rudolph - *Sphagnum* culture techniques.

E. Simon - Axenic cultures of *Sphagnum* on solid substrates.

N. Ashton - The isolation of biochemical and developmental mutants in *Physcomitrella patens*.

N. Ashton - Genetic analysis in *Physcomitrella patens*.

U. Geier - Moss protonema: protoplasts and transport of auxin.

K. Katoh - Effect of sugar on the callus formation and regeneration of a liverwort.

M. K. Menon - Extracellular secretion of polysaccharides from moss callus cells

K. Nehira - Germination and protonemata.

N. Ashton - Medium acidification by *Physcomitrella patens*.

There was a break for lunch after the sixth paper. All sessions were divided for light refreshments, giving participants a chance to discuss new ideas or peruse the collection of technique posters arranged along the hall and stairways. A varied selection of drinks, cakes, biscuits and savouries were always provided and we are indebted to the students of the Botany Department for providing this service.

The second session, Protein Techniques, included three papers:

H. Deising - Electrophoretic and Immunodetection of nitrate reductase from *Sphagnum*.

S. Bhatla - Analysis of differentiation-specific-proteins by electrophoresis and isoelectric focussing, using hormo-sensitive mutants of *Funaria hygrometrica*.

M. Krazakowa - The usefulness of electrophoresis for taxonomy and genetics of bryophytes.

Lectures were completed by 17.15. Professor Hartmann led a tour of the culture rooms, growth cabinets and fermenter room maintained by the Institute and described how these facilities were used by the bryologists at Mainz University. Professor Cove and Dr Ashton demonstrated techniques for isolating and examining mutants of

Physcomitrella patens including protoplast fusion and genetic analysis.

An excursion was planned for Sunday 19th July to the Rhineland countryside. A large party assembled outside the Hauptbahnhof in Mainz and two coaches were provided one with a German, the other an English speaking guide. First stop was Eltville, a very pretty village on the banks of the Rhine. Here we learnt a little about the history of the settlement and the importance of viticulture to the community. At Eberbach Monastery we were given a brief insight into the life of a Cistercian monk and a chance to try some of the local wines with lunch, a privilege the monks were denied. In the afternoon we followed the Wispertal valley to Laukermühle, where the party divided between those keen to continue the wine tasting and the more energetic bent on exploring the Taunus Forest. Most people managed to combine some bryology with a little light refreshment before we returned to Mainz.

Monday 20th July was devoted to a session on Chemical Methods followed by Ecology in the afternoon. The Chemical Methods session included seven presentations:

R. Mues - Thin-layer chromatography (TLC) of flavonoid compounds from bryophytes.

Y. Asakawa - Separation and isolation of terpenoids from liverworts and their analysis.

J. Wilschke - HPLC analysis of phenolics.

G. Raeymaekers - Chlorophyll extraction in mosses through dimethyl sulphoxide (DMSO).

Z. Tuba - Method for the determination of the entire photosynthetic pigment composition of bryophytes.

P. Beutelmann - Analysis of bryophyte lipids.

H. Pfaffmann - Analysis of phospholipids and assay for phospholipases in mosses.

The Ecology session included three presentations:

S. Russell - Bryophyte growth measurement techniques.

R. Lewis-Smith - Recording bryophyte microclimatic conditions in remote and severe environments.

R. E. Longton - Growing mosses on a water-content gradient.

Both sessions included techniques ranging from the simplest method with the minimum of equipment to the most sophisticated and expensive apparatus used by the experienced investigator.

Each day lectures were followed by a demonstration session including the techniques described and this provided ample opportunity to ask questions or even to practise the methods described. It was necessary to decide which practical to attend as each was located within a different room in the Biology Building. Fortunately, there were plenty of maps available and there were always willing helpers to provide directions. A special mention must be made of the conference secretaries, Renate Muller and Martina Weber for their willingness to solve problems and co-ordinate arrangements.

The Ecology practical included a video on the use of infra-red gas analysis in the field. Alternatively, one could examine the apparatus used to determine the microclimate and its effect on Antarctic bryophyte growth. In the laboratory marked Chemical Methods one could prepare a thin layer chromatogram, analyse the lipid composition of *Orthotrichum affine* or use specific spray reagents to detect the flavonoid pattern in *Rhizomnium cuspidatum* or *Leptobryum pyriforme*.

On Monday evening a visit to Mainz Naturhistorischen museum and moss collection was arranged. The museum is the oldest of its kind in West Germany, but a short guided tour demonstrated that some exhibits were far from antiquated with live as well as stuffed animals on display. The museum visit was followed by refreshments in a city wine cellar "weck, worscht un' woi" (roll, pork sausage and wine) a typical snack of Mainz accompanied by at least 14 different wines from the region and some entertaining anecdotes from our hostess.

Tuesday 21st July included a morning session entitled Pollution and Different Methods. In the afternoon the choice was between Computer Applications or one or more of seven different practical demonstrations.

The Pollution and Different Methods session included the following topics:

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Bryological Methods Workshop

(continued from p.7)

A. Empain - A posteriori detection of heavy metal pollution.

M. Kirchoff - Heavy metal analysis (Cd, Pb) in *Sphagna*.

D. H. Brown - Sequential elution technique for determining the cellular location of cations.

J. Sarosiek - Air pollution - cation location.

J. Janssens - Paleoecology of bryophytes and the investigation of natural and anthropogenic acidification of peatlands.

H. A. Miller - Bryophytes in educational contexts.

B. O. van Zanten - Methods in experimental bryogeography, a preliminary report.

The Computer applications session included:

J. P. Frahm - Computer application for bryology.

M. Michaelis - Digital image analysis of developing mosses.

A. Empain - A taxonomy-orientated computer language.

H. O. Whittier - Microcomputer applications to large taxonomic and biogeographic data files.

D. Vitt - Numerical taxonomy.

Not to be missed was a demonstration of epiphytic bryophyte collection (usually performed in tropical rain forests but improvised in the stairwell) in which an intrepid bryologist, complete with climbing ropes and clips was hoisted 10 m up the wall to collect his specimens and returned safely to the ground - not for the faint hearted!

Sessions on Microscopical methods and Biophysical methods and Photography completed the formal proceedings on Wednesday 22nd July.

In the Microscopical Methods session the papers were:

J. G. Duckett - Preparation of bryophytes for T.E.M.

G. Nordhorn-Richter - Primary fluorescence in bryophytes.

E. Hartmann - Fluorescence labelling of moss cells and protoplasts.

The Biophysical Methods and Photography session covered:

T. Zawackki - Methods in bioelectricity.

S. Takaki - Cell membrane isolation.

Z. Iwatsuki - Field macro-photography techniques.

Wednesday afternoon was devoted wholly to practical and poster demonstrations including all the techniques discussed. And what a variety of activities were provided! One could examine primary fluorescence in asexual propagules of *Bryum* species or in labelled protonemal cells, attend a seminar on axenic culture, one could discuss electrophoresis or the preparation of mosses for transmission electron microscopy or find the bugs in the computer applications for bryophyte taxonomy: no one could stand idle. Improvements, modifications, applications - everyone had some new idea to take home to their research group and for this we should be grateful to all those who prepared and transported a practical presentation to Mainz and to the organisers, Dr J. Glime and especially Prof. Hartmann and Dr Beutelmann and their staff for providing the facilities.

Two excursions were planned for Thursday 23rd July: a bryological excursion to the Karlstal, where such rarities as *Fontinalis squamosa*, *Schistostega pennata*, *Nowellia curvifolia* and *Scapania undulata* could be found or a visit to Gutenberg museum and the beautiful Cathedral of Mainz.

On Wednesday evening at the Workshop Dinner and Farewell Party, there was great frivolity. Professor Asakawa led the entertainment and there was dancing and even a little singing contributing to a feeling of unity and companionship. Dr Gradstein thanked everyone on behalf of the IAB. The first bryological workshop was over and had been a great success. University of Reading, Reading, England.

IAB Computer Workshop

The first IAB Computer workshop will be held at the University of Liège field station in Mont Rigi, Belgian Ardennes, from Friday 24 February 1989 (evening) to Monday, 27 February 1989 (noon). For details see the first announcement in *Bryological Times*, 46: 7.

The price will be BF 3300 (approx. DM 160, £55, US\$ 95) inclusive of all costs (participation, accommodation, all meals, drinks, coffee and evening bar). The full programme will be published in the next issue of the *Bryological Times*, and will in any case be sent to all who register.

Colleagues interested in participating please write for a registration form to: Dr. J.-P. Frahm, Universität Duisburg, Fachbereich 6, Botanik, Postfach 101629, D 4100 Duisburg, F.R.G.

Nova Hedwigia

From vol. 46 (1988) onwards the editors for the Bryophyta and Pteridophyta parts are:

Prof. Dr. W. Frey
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and

Prof. Dr. D. H. Vitt
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University of Alberta
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Manuscripts are kindly requested for consideration for publication.

THE WORLD OF MOSSES

Special arrangements have been made for IAB to offer to its membership: **THE WORLD OF MOSSES**. Original water colour studies printed on acid-free NOTE CARDS (9 x 14 cm) by Robert Muma

Species included are *Dicranum polysetum*, *Eurhynchium hians*, *Campylopus trachylepharon*, *Fissidens taxifolius*, *Funaria hygrometrica*, *Minium insigne*, *Philonitis fontana* and *Splachnum rubrum*. 8 colored note cards packaged and sent post paid \$10.00 Canadian funds (or \$8.00 US) payable to IAB c/o Dale H. Vitt, Botany Department, University of Alberta, Edmonton, Alberta, T6G 2E9.

Bulletin of Bryology No. XXIV*

Contents

Bischler, H. & S. R. Gradstein. **Bryological Societies: An Overview.** A revised and updated version of a paper presented at the Diamond Jubilee Meeting of the British Bryological Society in 1983 examines the goals, activities, similarities and differences among formal and informal organizations of bryologists. In addition to the International Association of Bryologists, there are formally organized regional bryological societies in Great Britain, North America, the Netherlands, Switzerland, Fennoscandia, Japan, Poland, Belgium, Latin America and India, in order of establishment. There are also informal groups in central and eastern Europe, and Australasia. Attention is drawn to the regrettable lack of either formal or informal bryological societies in southern Europe, that is, France, Spain, Portugal, Italy and Greece. Although each society, group or association is characterized by certain unique features, shared aspects include the organization of meetings, fieldtrips, teaching, exchange and identification of specimens.

Herrnstadt, I. & C. Heyn. **Bryology in Israel.** A report on the present status of bryological research in Israel is presented in the context of the historical development of bryology in that country.

Higuchi, M. **Recent bryological activities in Japan.** The World Conference of Bryology was the impetus for the organization of annual workshops for young Japanese bryologists. These workshops provide an opportunity for them to present a report on their research, which is followed by a general discussion. Also recently, Hiroshi Inoue has organized a series of bryological seminars, which have been held at the National Science Museum in Tokyo on a bi-monthly basis since 1984. The participants include undergraduate and graduate students of universities, high school teachers, and staff members of national and private laboratories.

Engel, J. J. **Review of George A. M. Scott's Southern Australian Liverworts.**

Horton, D. G. **Schofield awarded Lawson Medal for Introduction to bryology.** Both the author and the publisher have been recipients of awards for Schofield's new bryology text.

* Published in *Taxon*, 36(4): 768-775, 1987. Editor Dr. D. G. Horton

Bulletin of Bryology XXV*

Contents

Afonina, O. J. & B. M. Murray. **Conference of the Bryological Section of the Scientific Council of the Academy of Sciences of the U.S.S.R. Dedicated to the 100th Anniversary of the Birth of L. I. Savich-Lyubitskaya.** This report on the Conference that was held in Leningrad in October of 1986 is based on the Conference program and report that was subsequently prepared by O. M. Afonina. These were abstracted and translated by B. M. Murray with O. M. Afonina's assistance when B. M. Murray recently visited the Botanical Institute of the Academy of Sciences. The report includes a summary of the presentations that were given in the five sessions at the Conference, including author and title of the paper, as well as an abstract of the contents of most of the papers. In addition, a complete list of participants at the Conference, with notations on area of research interest for most, are also included.

Frahm, J.-P. **Bryological Methods Workshop, Mainz (FRG).** The success of the Bryological Methods Workshop that was held in July of 1987 prior to the XIV International Botanical Congress is attributed to the innovative style of organization. The Workshop consisted not only of lectures, but included practical demonstrations of various methods and techniques. Proceedings of the Workshop are being edited by J. M. Glime and will be published in 1988 by the Hattori Botanical Laboratory.

Vitt, D. H. **Bryology at the MIV International Botanical Congress.** Names of contributors to

eight symposia, that included aspects of bryophyte biology, and of those who presented posters on bryological research at the Botanical Congress are reviewed. There is also a report on the highlights of the council and general business meetings of the International Association of Bryologists. The Berlin meeting is considered to have been most successful in view of the strong international representation of over 100 bryologists and the presentation of more than 50 papers that focussed on various aspects of research on bryophytes.

Inoue, H. William C. Steere Awarded the Hedwig Medal. The announcement that William C. Steere is the recipient of the Hedwig Medal in 1987 was made at the International Congress in Berlin. Steere was chosen in view of his innumerable contributions, both direct and indirect, to bryology. His long-time interest in fostering international relations among bryologists was also noted. Regrettably, Steere was unable to attend the meeting owing to the condition of his health.

Horton, D. G. William Campbell Steere Honoured by the New York Botanical Garden on the Occasion of His 80th Birthday. On November 4, 1987, the New York Botanical Garden sponsored a magnificent party to celebrate the 80th birthday of Bill Steere. One hundred and forty persons travelled from all over North America, Japan and New Zealand in order to attend the party. Guests included Bill and Dorothy Steere's three children and grandchildren, former colleagues, friends, staff of the New York Botanical Garden and numerous bryologists. W. R. Buck presented Steere with a Festschrift, "Bryostephane Steereana: A Collection of Bryological Papers Presented to William Campbell Steere on the Occasion of His 80th Birthday". It consists of 68 papers and is published as volume 45 of the series, *Memoirs of the New York Botanical Garden*.

Gradstein, S. R. Council of the International Association of Bryologists 1987-1993. Elected members of the Council of the International Association of Bryologists for the term 1987-1993 are listed, as reported in the *Bryol. Times*, 43:8.

* Published in *Taxon*, 37(2): 400-408, 1988. Editor Dr. D. G. Horton

* *

Two New IAB Publications

* *

The Conspectus of Bryological Taxonomic Literature

Part 1. Index to monographs and regional reviews

A conspectus is a survey or overview of a subject rather than a comprehensive account. The subject of the present work is botanical literature of particular relevance to the identification of bryophytes.

The subject matter is presented in two volumes. In this volume we give an annotated index of references to worldwide treatments (variously called monographs, revisions, reviews or overviews) of orders, families and genera, and comparable treatments for major geographical regions, e.g. a continent or a large part of one, or an area involving a number of states such as the Caribbean, Polynesia, the Himalayas, etc. The text of the companion volume - to be subtitled: guide to national and regional literature - will be arranged on a geographical basis. It will deal with bryological taxonomic literature at the national or state level and will include floras, checklists, bibliographies and related works. Thus the two volumes will complement one another and will allow the identification of unknown material to be attempted via a national or state flora or handbook on the one hand, or a regional or worldwide monograph on the other.

The aim has been to provide a wide selection of up-to-date works and the more worthwhile of the older publications, most of the literature cited having been published in the last fifty years. No taxonomic judgements have been exercised in the selection of references, content being the main criterion for inclusion. The sources of the data and the methods of selection and compilation are described.

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Bryophytorum Bibliotheca, 35, 272 pages. Paper DM 120,-. 14.2 x 22.5 cm. ISBN 3-443-62007-8. Published 27 May 1988

Advances in Bryology, Volume 3

The six papers comprising volume 3 of the *Advances in Bryology* treat various aspects of bryophyte ultrastructure. Together with the paper, "Desiccation and Ultrastructure in Bryophytes", by M. J. Oliver and J. D. Bewley in volume 2 of the *Advances* (1984), they provide a comprehensive summary of current investigations into the ultrastructure of mosses, liverworts and hornworts. Developmental, functional and descriptive aspects of the featured structures and organelles receive emphasis in these papers which contain a wealth of comparative data that is useful in assessments of the phylogenetic relationships of bryophytes. As a number of my colleagues continue to stress, bryophytes offer some unique advantages for research at the cellular and subcellular levels of organization. Ample documentation of this will be found in the papers that follow.

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275 pages, 14.2 x 22.5 cm. Bound. Approximately DM 120,-. ISBN 3-443-52001-4. Expected August 1988

Advances in Bryology

Volume 2. 1984. DM 80,- still available
Volume 1. 1981. Out of print.

Paid up personal members of the International Association of Bryologists are entitled to buy from the publisher copies of the *Conspectus* and the *Advances* at specially reduced prices.

All of the foregoing published by: J. Cramer in der Gebrüder Borntraeger Verlagsbuchhandlung
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US Agents: Lubrecht & Cramer Ltd, RD1, Box 244, Forestburgh, NY 12777, USA, TEL. (914) 791-7575.

PERSONALIA

DR. BENITO C. TAN will move from Los Baños to Manila in October 1988. His new address will be: Dr. Benito C. Tan, c/o ALCON, 629 T. Alonzo Street, Sta. Cruz, Manila, The Philippines. Dr. Tan would like to request that future correspondence, exchange of reprints, etc. be mailed to his new address in Manila. Likewise he requests the curators of foreign herbaria for a temporary suspension in the sending of herbarium specimens for exchange under his existing arrangements until a new herbarium address is announced by him later.

DR. DANIEL M. VITAL, Seção de Briologia e Pteridologia, Instituto de Botânica, Caixa Postal 4005, 01051 São Paulo - SP, Brazil (SP), has been named Chief of the Section of Bryology and Pteridology and Curator of the bryophyte herbarium. As a consequence the loan and exchange program in bryophytes has been reactivated. He can send duplicates to interested specialists of any genus or family of Brazilian bryophytes and welcomes requests.

Herb. Nees van Esenbeck

Due to a shortage of staff at Strassbourg (STR) it is difficult to provide loan material from the herbarium Nees van Esenbeck. The last curator, Dr. H. Brisse has left and has not been replaced.

For urgent loans please write to Monsieur J. Zeller, Jardin Botanique, Université Louis Pasteur, 28 Rue Goethe, 67083 Strassbourg Cedex, France, Telephone (University switchboard) : 88-358200, who will try to deal with such requests.

THE BRYOLOGICAL SOCIETY OF JAPAN

The secretariat of the Bryological Society of Japan was moved from National Science Museum, Tokyo to Hiroshima University, Hiroshima from Sept. 1, 1987. All communications should be addressed to:

Dr. Zen. Iwatsuki, Secretary, Bryological Society of Japan, Botanical Institute, Faculty of Science, Hiroshima University, Higashi-senda-machi, Hiroshima 730, Japan. (Postal Giro account: Hiroshima 9-38275)

RECENT PUBLICATIONS

Australas. Bryol. News, 17: 1-9, 1987; 18: 1-10, 1988.

Bryologist, 90(4): 285-474, 1987; 91(1): 1-72, 1988; 91(2): 73-160, 1988.

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Taxon, 36(4): 705-868, 1987; 37(1): 1-232, 1988; 37(2): 233-512, 1988.

MAGILL, R. E. 1987. Bryophyta Part 1 Mosses. Fascicule 2 Gigaspermaceae-Bartramiaceae. In Leistner, O. A. (ed.). Flora of southern Africa which deals with the territories of South Africa, Transkei, Lesotho, Swaziland, Bophuthatswana, South West Africa/Namibia, Botswana and Venda. Pretoria, Botanical Research Institute, Department of Agriculture and Water Supply, [i-iv]-ix, 293-443. 238 x 179 mm, soft covers. Available from Directorate of Agricultural Information, Dept. of Agriculture, Private Bag X144, Pretoria 0001, Republic of South Africa. Price on application.

This fascicule treats 100 species in 32 genera and has a key to families, genera and species. Each species is concisely described with keywords highlighted and has details of types, synonyms, habitats, notes on variability, details of voucher specimens and a summary of distribution. The illustrations (1 per species) include a habit drawing and there is a small map showing distribution in the area covered by dots in a lat./long. grid. A particularly useful feature is the summary list of 11 new taxa and new combinations published in this fascicule given on p. vi. A note on the same page gives the date of publication as July 1987.

The treatment of the mosses will be completed in 4 fascicules, the liverworts forming part 2. A review of Part 1, Fasc. 1 appeared in Bryol. Times, 17: 8.

EDDY, A. 1988. A handbook of Malesian mosses Vol. 1 Sphagnales to Dicranales. London, British Museum (Natural History). [i-iii]1-204, 250 x 174 mm. Soft covers. Available from British Museum (Natural History) Publications, Cromwell Road, London SW7 5RD, price £15.00.

Students of the Malesian bryoflora, surely one of the world's richest and most diverse, have long had to rely for an overview of the region's mosses on the classical works of F. Dozy & J. H. Molkenboer (1855-70) Bryologia Javanica.... and M. Fleisher (1904-23) Die Musci der Flora von Buitenzorg. Almost overnight, it seems, all this has changed (as reported elsewhere in this issue p.5) and to add impetus to this change this first fascicule of a projected 5 fascicule work has been published. A map on p.1 shows the extent of the geographically large and complex tropical area it covers which extends "from Peninsular Malaysia southwards and eastwards to include New Guinea and the Philippines". The families treated in this fascicule are the Sphagnales, Andreaeales, Polytrichales, Fissidentales and the Dicranales (excluding the Leucobryaceae).

According to the author "The main aim of this book is to provide a practical and reasonably comprehensive aid to the identification of Malesian mosses, presented in a form that requires a minimum of bryological expertise on the part of the user". What the user gets is a clearly laid out concise description of each taxon with important features emphasized, a minimum of jargon (a glossary provides clear explanations for the technical terms used), information on habitats and distribution within the area, helpful comparative notes on variability, synonymy and clear line drawings that show habit, morphological and cellular detail. Keys are provided within the orders to genera and within the latter to species, the intention being to provide what is called "a general key" when the work is completed. The author's hopes that "should this concise guide provide a foundation for, and stimulate further interest in, the bryological riches of this exceptionally diverse and underexplored region, it will have attained its main objective" seems unduly modest as this Handbook is likely to become a standard reference work for a long time to come.

BUCK, W. R. (ed.). 1987. *Bryostephane steereana*: a collection of bryological papers presented to William Campbell Steere on the occasion of his 80th birthday. Memoirs of the New York Botanical Garden, 45: [i]-vii-x, 1-778, 254 x 175 mm, soft covers. Issued 4 November 1987. Available from the Scientific Publications Office, The New York Botanical Garden, Bronx, New York 10458, U.S.A. Price (including postage and handling fee): US orders US \$136.05; elsewhere \$138.40.

Presented to "Bill" during his 80th birthday party (see *Bryol. Times*, 45: 1, 5) this "Festschrift" volume, conceived and orchestrated by its editor, contains 67 articles written by 83 bryologists to a strict 6-month deadline. A unique and charming feature is a 68th article (the 1st in order of presentation) entitled 'A letter from Dorothy', written by Bill's wife, which gives many insights into their life together.

The contents of the volume are grouped into 9 sections covering bryological topics dear to Bill's heart or of interest to him for one reason or another. These sections, with the number of articles in brackets, are Biographical and historical bryology (4); Morphological, anatomical and cytological bryology (8); Physiological and ecological bryology (4); Floristic bryology: North America (6); Paleobryology: The Americas (2); Floristic bryology: Tropical America (9); Bryogeography (3); Floristic bryology: Australasia, Oceania and Antarctica (24); and Monographic bryology (8). The volume ends with a 30-page index to authors and bryophyte names.

Well prepared and well presented with a wealth of photographs, maps, figures and line drawings, this volume is a fitting tribute to one who has so directly influenced the development of bryology in North America over the last 50 years. To him 83 of his colleagues have offered directly, and many others indirectly, the crown of plants, the Stephane or diadem of the classical world.

GREUTER, W., BURDET, H. M., CHALONER, W. G., DEMOULIN, V., GROLLE, R., HAWKSWORTH, D. L., NICOLSON, D. H., SILVA, P. C., STAFLEU, F. A., VOSS, E. G. & J. McNEILL. 1988.

International code of botanical nomenclature adopted by the fourteenth International Botanical Congress, Berlin, July-August 1987. *Regnum vegetabile*, 118: [i]-iv-xiv, 1-328. 238 x 160 mm, hardback. Available from Koeltz Scientific Books, D-6240 Königstein, Federal Republic of Germany, Price DM 60.

This, yellow-covered, "Berlin Code" has appeared in record time. In page size it is similar to its predecessor but in length is shorter due chiefly to the fact that the text is in English only, lacking the French and German versions that have been a feature from the first, "Vienna Code" of 1905. A French text is being prepared and German and Spanish versions are being considered. Perhaps the major change over the last Code is the extension of provisions for the conservation of specific epithets. In addition to species of major economic importance, conservation of names of species is now possible in two other situations, the commonest being situations where a name has been widely and persistently used for a taxon or taxa not including its type.

As far as text changes are concerned, the greatest revision will be found in Section 2, which deals with typification. In addition to classification some new provisions have been added such as the requirement to specify, from 1 Jan. 1990, the place of preservation of the type of a name of a species or infra specific taxon. Also relevant to typification is the requirement that all nomenclatural actions regulated by the Code must appear in effectively published works in order to be taken into consideration. Other changes of note in the new Code relate to illegitimacy, orthography and to the renaming of hybrids.

The editorial committee is to be congratulated on the speedy appearance and relatively modest cost of this work, so essential to the working taxonomist.

STAFLEU, F. A. & R. S. COWAN. 1988. Taxonomic literature A selective guide to botanical publications and collections with dates, commentaries and types Volume VII: W-Z. 2nd edition. *Regnum vegetabile*, 116: [i]-vii-lvi, 1-653. Hardback. Available from Bohn, Scheltema & Holkema, Utrecht/Antwerpen; dr. W. Zunk b.v., Publishers, The

Hague/Boston; and from the Scientific Publications Office, the New York Botanical Garden, Bronx, New York, 10458, New York, U.S.A..

With the appearance of volume 7, the monumental and indispensable TL-2 has come to an end. The first edition (Stafleu, F. A., 1967: *Regnum vegetabile*, 52: [i]-iv-xx, 1-556), treated cryptogamic botany less thoroughly than phanerogamic botany, and was hardly known to, and little used by, bryologists. But in TL-2 bryologists and bryological literature have benefited from a very much better coverage.

The formula for presenting the information has remained constant throughout the 7 vols. After an author's name and dates comes a brief biographical diagnosis, a suggested abbreviation of the author's name and details of herbaria, manuscripts and types. Then comes a list of sources of bibliographical and biographical literature, sources of published samples of handwriting, eponymy (generic names of plants and names of periodicals based on the author's name), portraits on postage stamps and a list of composite works, i.e. works produced jointly with one or more authors. The treatment of an author's works completes the entry. These works are chiefly books in the early volumes but they are progressively supplemented by works in periodicals in later volumes. For each work the full title, imprint, suggested short title, suggested abbreviated title for reference purposes, notes on precise dates of publication, description of the composition of the work, references to special studies on it, copies seen, notes on reprinted editions and anything else pertinent is given.

In this 7th and last volume, entries will be found on G. Wahlenberg, C. [F. E.] Warnstorf, F. Weber, F. von Wettstein, R. S. Williams, W. Wilson, J. E. Zetterstedt, G. Zodda, G. H. Zschacke and many others. Each of the volumes represents a veritable Aladdin's cave of information on a range of topics of relevance to the practising taxonomist fulfilling in a truly magnificent way the author's main objectives "to provide a guide to the literature and collections of immediate relevance for today's taxonomists". For a discussion of the aims and scope of TL-2, written at around the half way mark, see *Taxon*, 28(1, 2-3): 77-86, 1979.

British Bryological Society: Computer Techniques Workshop

This year's BBS techniques workshop will be devoted to the use of computers in bryology. It is intended particularly for those without a great deal of experience in computing, although the sessions will be aimed also at those with more experience. The details are as follows:

Bryological Workshop, 1988, Bristol, 19-20 November
Local Secretary: Dr. D. H. Brown, Department of Botany, The University of Bristol, BS8 1UG.
Programme organiser: B. J. O'Shea, 131 Norwood Road, London, SE24 9AF.

We will try to cover, with a strong practical bias, such topics as word processing, data bases, statistics,

spreadsheets and graphics, and specific bryological applications such as herbarium management, bibliographies, taxonomy, ecology and mapping. The content is intended to be flexible. It will be geared as far as possible to the needs of those attending but will be based on IBM-compatible micro-computers. Participants with their own IBM-compatible micro (preferably with 5.25" diskettes) are asked to bring it along if possible, as we do not yet know how many we will be able to make available.

Well over a hundred disks from the IAB Software Library will be available for demonstration and use (and may be copied if you supply your own 5.25" diskettes), as well as commercially available products.

Please contact Denis Brown as soon as possible if you are thinking of coming. Contact Brian O'Shea if you want more details of the likely programme.

Full details of the arrangements and programme will be mailed in September to those who have contacted Dr. Brown. It is not expected that there will be a great deal of overlap between this and the IAB Workshop in February 1989, although the BBS meeting might be regarded as a useful precursor to the IAB Workshop for those who are new to computing.

Brian O'Shea, 131 Norwood Road, London, SE24 9AF, U.K.

DIARY

For explanation of acronyms, see *Bryol. Times*, 31:7-8, 1985.

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June 1-8. Tropical bryological workshop. Puerto Rico. Organized by Inés Sastre-De Jesús and S. Rob Gradstien primarily to acquaint temperate bryologists with tropical bryophytes. Registration and information available from: Dra. Inés Sastre-De Jesús, Dpto. de Biología, Universidad Católica, Ponce, Puerto Rico 00731.

June 17-19. SBLs Annual assembly. Steg (principality of Liechtenstein) with lectures and excursions to Saminatal and Sareiserjoch (northern calcareous Alps). Further information from Dr. Klaus Ammann, Syst.-Geobot. Institut, Altenbergrain 21, 3013 Bern, Switzerland.

July 19-23. Joint BBS - British Ecological Society Meeting, Edinburgh. International Symposium on bryophyte ecology. For outline programme see *Bryol. Times*, 44:3. Local Sec.: Dr. P. J. Lightowlers, Institute of Terrestrial Ecology, Bush Estate, Penicuik, Midlothian, Scotland EH26 0QB.

July 23-30. BBS Summer field Meeting, Aigas Field Centre, Beaulieu, Invernesshire. Local Sec.: Dr. P. J. Lightowlers. Participants at the BBS ecological symposium (see July 19-23) will be most welcome.

Aug. 5-7. BSJ 17th Annual Meeting, Sanda City, ca. 25km N. of Kobe City, with paper-reading sessions and field study. Further information from Dr. N. Kitagawa, Biological Laboratory, Nara University of Education, Takabatake-cho, Nara 630, Japan.

Aug. 7-12. NBS Annual Meeting and Excursions, Kitee, Pajarinhovi Travel Centre, Finland. Further details from Dr. Matti Haapasaari, Kuopio Museum of Natural History, Myhkyrinkatu 22, 70100 Kuopio, Finland.

Aug. 7-11. ABLs Annual Meeting in conjunction with AIBS meeting, University of California, Davis, U.S.A.

Aug. 13-14. ABLs Field trip to Mendicino County, California, through redwood forests, coastal bluffs, pine forests and oak woodlands. Further details from Brent D. Mishler, Dept. of Botany, Duke University, Durham, N.C. 27706, U.S.A.

Aug. 28-2 Sept. BLAM Virgen (Osttirol). Leaders: J. Poelt (Graz) & G. Gärtner (Innsbruck). Further information from Doz. Dr. G. Gärtner, Institut für Botanik, Sternwartestr. 15, A-6020 Innsbruck, Austria.

Aug. 31-2 Sept. Phytochemical Society of Europe. Saarbrücken. International Symposium on the chemistry and chemical taxonomy of bryophytes. Further information from Prof. H. D. Zinsmeister or Dr. R. Mues, Fachrichtung Botanik der Universität der Saarlandes, D-6600 Saarbrücken 11, B.R.D. (See *Bryol. Times*, 43:11).

Sept. Alma-Ata, Kazakhstan. Meeting of the Bryology Section of the Scientific Council of the Academy of Sciences of the USSR. Information from Dr. V. K. Mamatkulov, Institute of Botany, Academy of Sciences, Tadzhik S.S.R., Karamova St. 27, Dushambe, Tadzhik SSR. 734017, USSR.

Sept. 4-10 AETFAT Congress, Hamburg, F.R.G. Symposium on African bryology and lichenology. See preliminary notice in *Bryol. Times*, 44:3.

Continued over.

- Sept. 12. 6th CEBWG Meeting, Liblice (Village near Melnik) Czechoslovakia. For preliminary announcement of this 4-5 day meeting, see *Bryol. Times*, 40:10.
- Sept. 14-18. SBLs Field work in the Jura Neuchâtelois (La Côte aux Fées) bryophyte mapping of the region. Further information from Dr. Klaus Ammann, Syst.-Geobot. Institut, Altenbergrain 21, 3013 Bern, Switzerland.
- Sept. 16-18. 6th Midwestern bryological foray. Black River Falls, Wisconsin U.S.A. See this issue, p. 6. Further information from Dr. John A. Christy, Bryological Foray, Botany Section, Milwaukee Public Museum, 800 West Wells St., Milwaukee, WI 53233, U.S.A.
- Sept. 17-18. BBS A.G.M. and paper reading meeting, Liverpool, Local Sec.: Dr. J. Edmonson, Merseyside, County Museums, William Brown St., Liverpool L3 8EN, U.K.
- Sept. 23-25. The 1988 Andrews Foray, U.S.A. Pocono Environmental Education Centre (PEEC), Dingman's Ferry, PA. Contact Dr. Richard Andrus, Dept. of Biological Sciences, SUNY Binghamton, Binghamton, NY 13901, U.S.A.
- Sept. 24-25. SBLs Taxonomic workshop on the genus *Tortella*, with R. May (Duisburg). Botanical Institute, University of Zürich. Further information from Dr. Klaus Ammann, Syst.-Geobot. Institut, Altenbergrain 21, 3013 Bern, Switzerland.
- Sept. 30-2 Oct. 4th Annual Blomquist Bryological Foray, Georgia, U.S.A. Based at Cloudland Canyon State Park, Dade Co., in the northwestern corner of Georgia. See this issue p.6. Application forms and further information from the organizers: Ann Stoneburner or Robert Wyatt, Department of Botany, University of Georgia, Athens GA 30602 USA.
- Oct. 18-23. SLAB Bogotá, Colombia. 1st Simposio Latinoamericano de Briologia. See *Bryol. Times*, 45:4. Further information from Prof. Jaime Aquirre C., I Simposio Latinoamericano de Briologia, Apartado Aéreo 7495, Bogotá, D.E., Colombia.
- Oct. 29-2 Nov. 4th WGMBE Meeting, Mont-Rigi, Belgium. Further information from Prof. Dr. R. Schumacker, Université de Liège, Station Scientifique des Hauts-Fagnes, B-4898 Waimes, Belgium.
- Nov. 19-20. BBS Bryological Workshop, Bristol. See this issue p. 13. Further information from the Local Sec.: Dr. D. H. Brown, Dept. of Botany, The University, Bristol, BS8 1UG.
- Nov. 26. VWGB Joint meeting with Royal Belgian Botanical Society. Further information from L. Smets, A. Van Dijkstraat 13, 2300 Turnhout, Belgium.
- Dec. 3-10. Australasian Bryological Foray, Hobart, Tasmania. Further information from Dr. R. D. Seppelt, Antarctic Division, Channel Highway, Kingston, Tasmania 7050, Australia.
- Times*, 46: 7 and this issue p. 8. Further information from Dr. J.-P. Frahm, Universität Duisburg, Fachbereich 6, Botanik, Postfach 101629, D 4100 Duisburg, F.R.G.
- Feb. or March. BBS Special overseas spring meeting, The Algarve. Local Sec.: Mr. A. R. Perry, Dept. of Botany, National Museum of Wales, Cardiff, CF1 3NP.
- April. BBS Spring field meeting, Salisbury. Local Secs.: Mrs V. Williams, Two Bridges, Lyburn Road, Hamptworth, Salisbury, Wilts., SP5 2DB, and Mr. R. C. Stern, Botany Bay, Main Road, Fishbourne, Chichester, West Sussex, PO18 8AX.
- July or Aug. BBS Summer field meeting, Aberystwyth. Local Sec.: Mr. A. Orange, Dept. of Botany National Museum of Wales, Cathays Park, Cardiff, CF1 3NP.
- Aug. 6-10. ABLs Annual Meeting in conjunction with AIBS Meeting, Univ. of Toronto, Canada.
- Sept. BBS A.G.M. and paper-reading meeting, Lincolnshire. Local Sec.: Dr. M. R. D. Seaward, Postgraduate School of Studies in Environmental Science, The University, Bradford, BD7 1DP.

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- July. 1-7. IV International Congress on systematic and Evolutionary Biology. Maryland, University of Maryland, College Park, U.S.A.
- Aug. 12-18. Helsinki, Symposium on SE Asian bryophytes. See preliminary announcement in *Bryol. Times*, 41: 4.

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- Feb. 24-27. IAB Computer Workshop Mont Rigi, Belgium. See *Bryol.*

THE INTERNATIONAL ASSOCIATION OF BRYOLOGISTS publishes *The Bryological Times* every two months, the *Bulletin of Bryology* twice a year, and the *Advances in Bryology* irregularly. Material for the *Bryological Times* can be sent at any time, but submission dates for the *Bulletin* and the *Advances* should be discussed with the Editors, Dr. Diana G. Horton (University of Iowa) U.S.A. and Dr. Norton G. Miller (Albany) U.S.A. respectively. The Editors do not accept responsibility for the views of the authors. For details regarding membership of the International Association of Bryologists (currently U.S. \$8.00 p.a.), write to the Honorary Secretary, Dr. Dale H. Vitt, Department of Botany, University of Alberta, Edmonton, Alberta, Canada, T6G 2E9.

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