

Bryophyte Conservation a new column in *The Bryological Times*

by Tomas Hallingbäck and Edi Urmi

At the Symposium "Endangered Bryophytes in Europe - Causes and Conservation", Uppsala, 24-28 September 1990, two international committees were established to deal with the problems of endangered bryophytes and bryophyte conservation. In conjunction, it was decided to set up a news column on "Bryophyte Conservation" in *The Bryological Times*. In this introduction we would like to set out our goals for this column. Moreover, we will provide some information on the committees for protection of bryophytes.

Today many bryologists are doing research on the biology of endangered species and threatened habitats. We realize that many of you may have ideas as to which species and habitats

are endangered and how to act efficiently. You are very welcome to contribute to this column and to assess species which may be placed on an European and a world preliminary list of endangered bryophytes. We would also like to receive contributions on species, regions and localities in urgent need of research. Our immediate goals for the column are:

- to provide a place for debate on endangered bryophytes and conservation strategies
- to inform our readers of current news and progress of research on endangered bryophytes and conservation

The IAB standing Committee for Endangered Bryophytes (ICEB)

This international committee was initiated by the IAB and established during the symposium "Endangered Bryophytes in Europe - Causes and Conservation" at Uppsala. It will work independently of IAB and will deal with all international aspects of preserving endangered bryophytes. Apart from the status as an IAB standing committee, it will soon be recognized as "specialist group" for bryophytes of the IUCN (International Union for Conservation of Nature).

Preserving species is one of the most important tasks and requires the pro-

continued on p. 2

Report

on the Symposium 'Endangered Bryophytes in Europe - Causes and Conservation'

by Sanna Laaka

Just as the spreading contamination of the environment and destruction of natural habitats reach today even the remotest regions, the concern for the cryptogamic flora and vegetation has also increased. Although many countries have compiled lists of endangered vascular plants, the cryptogams including bryophytes were forgotten until recently. However, the symposium 'Endangered Bryophytes in Europe - Causes and Conservation' in Uppsala 24-28 September 1990, showed that one is aware of the threats against bryophytes.

All the 70 delegates from 17 countries including U.S.A., Canada, China, in addition to most of the European countries, agreed that something has to be done. Many local lists of threatened bryophytes were presented in the lectures, and posters called attention to species with limited ranges and strictly specialized habitat requirements. Several studies on the population dynamics and ecology of the bryophytes showed great advances in these fields of study. The main disagreements during the discussions concerned the definitions of terms. For example, the term "endangered" is used both in a wide and in a narrow sense. According to the IUCN, the term "endangered" is used for species which are in serious danger of disappearance in the near future. One important aim of the symposium was standardizing the use of the terms.

continued on p. 3

Contents

Bryophyte Conservation	1
Symposium Endangered Bryophytes in Europe - Report	1
Opening Address	3
Bryophyte Conservation in Germany	4
Flora Neotropica News	4
Bryological Explorations in the Kumaun Himalaya	5
Software Library	7
New Publications	10
Meetings	11
Personalia	11
Requests	11
Diary	12
Colophon	12

contd p. 1: Bryophyte Conservation

tection of habitats large enough to preserve the species in reproductive populations in their natural environment. Of course, this is actually unattainable as a goal on a globe subjected to ruthless exploitation, but we have to be optimistic and struggle towards our goal as much as possible.

We think it is important that the committee collects information on the status of rare and decreasing bryophytes in the world, initiates research on their world distribution and highlights the causes for their decrease. The information should be transferred to conservation authorities to be used for practical conservation measures. The committee is composed of a chairman, a vice chairman, a secretary, a member with contacts with conservation organizations and three additional members representing different continents. The term of the committee is six years. The committee will meet once a year. At these meetings information on the current situation will be summarized and discussed and guidelines for the future work be established.

Already we have discussed to prepare a Global Red List. In order to do this, a questionnaire will be sent during 1991 to all bryologists in which information on rare and endangered species, including their distributions, threats and biotopes, is requested.

Members of the board 1990-1996:*Chairman*

- Tomas Hallingbäck (Sweden)

Vice Chairman

- Richard Andrus (U.S.A.)

Contact with other organizations

- Nick Hodgetts (Great Britain)

Additional members

- Tamas Pócs (Hungary) representing Central Europe and African tropics
- Benito Tan (U.S.A.) representing Asia (tropical part)
- Heinar Streimann representing Australia
- Latin America is still vacant

The European Committee for the Conservation of Bryophytes (ECCB)

This committee was established for several reasons. One was to encourage the compilation of a European Red List of bryophytes. Other important tasks are to put forward the preservation of endangered species in Europe as well as to suggest habitats and localities in urgent need of protection.

At least one representative from each European country, with a deputy, will be included in the ECCB. The committee shall meet once every three years. The board of the committee was formed during the symposium and the following members agreed to work on the board for the period 1990 - 1992:

Chairman: Edi Urmi (Switzerland); Vice Chairman: René Schumacker (Belgium); Secretary: Nick Hodgetts (Great Britain); Additional members: Jirí Vána (Czechoslovakia), Cecília Sérgio (Portugal) and Tomas Hallingbäck (Sweden).

The work of the committee aims at preserving the European bryophyte species in reproductive populations in their natural environment. The committee is planning to compile and coordinate information on the status of rare, decreasing and endangered bryophytes in Europe; to promote, together with the Working Group of Mapping Bryophytes in Europe (WGMBE), further mapping of their European distribution and analyse the causes for their decrease. The information should be transferred to conservation authorities and be used for practical conservation measures.

The committee is a subcommittee of the IAB standing Committee for Endangered Bryophytes (ICEB) but works independently. It has no funds of its own and the work is not paid for. At the meetings (board once a year, committee every third year) information on the current situation will be summarized and discussed, and guidelines for future work shall be established.

Suggestions of immediate tasks in-

clude:

- to compile an European Red List of Bryophytes
- to compile a list of European bryologists working on endangered bryophytes
- to initiate research on the status and ecology of endangered species or other species with rapidly declining populations
- to encourage more bryofloristic fieldwork in neglected parts of Europe
- to initiate meetings and symposia on Endangered Bryophytes supported by the ECCB and the IAB

Everyone who wants to assess species for the European Red List or would like to collaborate or to announce any new national or provincial red list etc. should contact Edi Urmi (address below).

The ECCB made its first achievement during the Uppsala Symposium in proposing a list of 26 selected European endangered bryophytes to be included in the Appendix I of the Berne Convention. This list was faxed immediately to the Berne Convention workshop meeting at Cambridge. The action was successful and for the first time at least some bryophyte species will be included in the new list of "strictly protected flora species" supported by the Council of Europe, also known as Berne Convention, Appendix I.

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contd p. 1: Report Symposium

The IUCN standards were generally recommended.

During the Uppsala symposium the 'IAB Standing Committee for Endangered Bryophytes' for promoting the conservation of the bryophytes was established (see page 1, this article). The Committee is an international agency, which reports regularly to the IAB Council.

A preliminary list of endangered bryophytes in EEC countries, including Macaronesia, was compiled for the EEC Commission of Environment during the Uppsala symposium. In the discussion, which probably heated most the delegates' feelings during the week, the chair was taken by Dr. Edi Urmi. Dr. René Schumacker acted as secretary. A list of about 20 bryophyte species representing endemic species, different threatened habitats and different types of threat, was finally approved, although some low discontented murmurs could be heard.

The outward circumstances of the Uppsala symposium were excellent. There was plenty of room and light in the campus of the Swedish University of Agriculture in Ultuna, outside the center of Uppsala. The meeting hall was comfortable, and the assembly hall with the poster exhibition was large enough for coffee-break discussions and closer views of the posters. A walk by the river from the nearby hotel to Ultuna campus provided a pleasant start for the day's lectures. The excursions to an old coniferous forest, Fiby urskog, to Lower Dalälven, and to the raised bog Ryggmossen north of Uppsala, were well planned. Even the weather was favourable. The symposium guests were honoured by the guidance of Prof. Hugo Sjörs in the Ryggmossen bog. One of the most impressive episodes in Uppsala was the visit to Linné's summerhouse in Hammarby, outside the Uppsala City, where "Linné's wife" amazingly lively told about the life of her famous husband. The Organizing Committee of the symposium (Dr. Tomas Hallingbäck, Dr. Lena

Gustavsson, Dr. Lars Hedenäs, Dr. Lars Söderström and Dr. Nils Cronberg) had done an enormous job, and absolutely not in vain, which I am sure all the participants of the symposium agree about.

If any words of criticism are needed, they are aimed at the lecturers, who still in the year 1990 flash those terrible overhead projector films or slides with dense tables full of tiny dots which one cannot discern, even from the first seat line, without binoculars.

All in all, the symposium 'Endangered Bryophytes in Europe - Causes and Conservation', 24-28 September 1990 in Uppsala, was a well-organized and successful meeting. Although the

situation is alarming for many habitats and species of bryophytes, it is pleasing to realize that the problems of rarity and the threats are increasingly taken seriously among bryologists, whose skill and knowledge are needed in producing useful theoretic background and methods for both the local and international conservation authorities.

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Opening Address

Symposium on 'Endangered Bryophytes in Europe - Causes and Conservation'

by Timo Koponen

Ladies and gentlemen,
The mainstream of bryological research has long been taxonomy and systematics of bryophytes. This is easily understood; we still do not know all the bryophytes of the world and there still are many unnamed taxa, so the work of taxonomists is not yet completed. Other such disciplines as physiology, ecology and chemistry have been effectively studied only in this century. The youngest branch of bryological studies is the research of endangered bryophytes and the causes of their decline. Taxonomic bryologists, however, have long been aware of the threat that human activities may cause for bryophytes. The oldest published record of which I am aware is by Philipp Bruch and Wilhelm Philipp Schimper in 'Bryologia Europaea'. After describing *Tayloria rudolphiana* they wrote (original in German and in French):

"Hornschuch gives the locality of this moss, incorrectly, as a quarter hour above St. Johann Waterfall at Radstadter-Tauern, while it actually

must be searched for nearly an hour beyond the waterfall. The locality is in a deep valley, through which Tauern Trail leads to the area of Untertauern, and it occurs preferentially on maple trees, which stretch their thickly moss-covered branches above Tauern Trail. The branches are 15 to 25 feet above the ground and in places they are totally covered by our beautiful moss, which is embedded in large cushions of *Leucodon sciurioides*. It is a pity that most of these trees will be cut down this year (1844) to widen the street. This is still more unfortunate, since the valuable burden of some maple trees a quarter hour below the waterfall, where Rudolphi probably found this moss, has been nearly completely robbed.

The locality given by Funk, Pasterze in Kärnten, is most probably not correct. On the other hand, one of us found last year (1843) a new locality in a dense forest of broadleaved trees at the foot of Dürrenstein in Oberösterreich. Accordingly, while the classical maples at Radstadter Tauern will fall by the blows of civilization, the beautiful

continued on p. 4

contd p. 3: **Opening Address Symposium**
Tayloria rudolphiana at least for some time being will be saved from extinction."

In this description, there are two causes that may lead to the extinction of a rare bryophyte: too much collecting for scientific purposes and cutting of forests. The latter has been the main reason for the diminishing populations of bryophytes in Europe. However, in old times forestry was based on manpower and horsepower, so the destruction of forests was rarely complete. There always remained some remote or inaccessible slopes or valleys that remained untouched. Nowadays, modern forestry with its huge machinery can destroy any forest at any site. Moreover, during the last twenty years air pollution has become another serious cause of extinction. The first effects of pollution are often seen in lichens and bryophytes, which has made them remarkable tools for monitoring pollution.

Since 1973 a series of major international bryological congresses has been held. The conservation aspect appeared for the first time in the Geneva Workshop in 1979 when Paul Richards drew attention to the activities of the British Bryological Society in this field. In the later congresses endangered bryophytes have been mentioned most often in connection with the destruction of tropical rainforest. We all may feel satisfied being participants in the first international meeting concentrating on the causes and conservation of endangered bryophytes.

As the President of the 'International Association of Bryologists', I bring the greeting of our association to this congress. I also can tell you that the Council of our Association has considered the topic of conservation of bryophytes and decided to establish a 'Standing Committee of Endangered Bryophytes'. This will happen in the last session of this meeting. I believe the new committee will work in connection with other international organisations so that the authorities of all

countries in the world will become aware of this aspect of the nature conservation.

Acknowledgements

I wish to thank Dr. Aune Koponen, who draw my attention to the text of 'Bryologia Europaea', and Dr. Diana Horton for linguistic corrections of my manuscript.

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Bryophyte Conservation in Germany

Bryologische Rundbriefe 3 (September 1990) presents an article on this subject by Jan-Peter Frahm under the title "Moose und Naturschutz". It appears that the following bryophyte taxa are legally protected in Germany:

Dicranum: all species
Hylocomium: all species
Leucobryum: all species
Polytrichum commune
Polytrichum formosum
Rhytidiadelphus: all species
Sphagnum: all species

Because of their protected status collecting of these bryophytes has not been allowed in Germany since 1 January 1987. For teaching purposes old herbarium material or material in cultivation should be used.

It is certainly astonishing that such common German species as *Dicranum scoparium*, *Hylocomium splendens* and *Rhytidiadelphus squarrosus* would appear on the list of protected taxa. The author has made some enquiries, but thus far the reasons for the selection of these common taxa remain unclear.

S. Rob Gradstein

Flora Neotropica News: Bryophytes

by S. Rob Gradstein

The Flora Neotropica monograph series was initiated in 1968 with the publication of the monograph of the legume genus *Swartzia*. Since that date 53 volumes have been published, mostly dealing with angiosperms and fungi, and thousands of species have been treated. The ultimate goal of Flora Neotropica is to publish taxonomic revisions of the entire flora of tropical America, including phanerogams and cryptogams. As the Neotropics has the most species-diverse vegetation of any major region of the world, with an estimated number of 90,000 species of flowering plants and 3-4000 species of bryophytes, the task to complete this Flora is certainly herculian. Nevertheless, some good progress is being made as the present report may indicate.

In the past two years five new monographs have been published - four on flowering plants and one on bryophytes (*Plagiotheciaceae*, by W.R. Buck & R.R. Ireland 1989, see *Bryol. Times* 53: 13) - and about ten more monographs are in the editorial process including the following on bryophytes:

J.P. Frahm: *Dicranaceae* subfam. *Campylopodioideae* and subfam. *Paraleucobryoideae* (65 spp.).
 W.D. Reese: *Calymperaceae* (55 spp.).
 I. Sastre-de Jesús: *Neckeraceae* (13 spp.).
 R.R. Ireland: *Isopterygium* (6 spp.).
 N. Salazar: *Leucophanes* (2 spp.).

Like the previous volumes, these treatments are being published for the Organization for Flora Neotropica by the New York Botanical Garden.

Colleagues wishing to contribute a monograph of neotropical bryophytes or other non-vascular plant group should write to S. Rob Gradstein,

continued on p. 5

contd p. 4: Flora Neotropica News

Deputy Director of Flora Neotropica, Heidelberglaan 2, 3584 CS Utrecht, The Netherlands. A detailed set of guidelines for the preparation of the manuscripts is available on request and grid maps of the neotropical region, for the preparation of distribution maps of species, can be bought at low cost. Monographs of the following groups of bryophytes are now in preparation for Flora Neotropica:

Musci

Amblystegiaceae - R. Ochrya
 Batramiaceae - D. Griffin
 Brachytheciaceae: *Brachythecium* - K. McFarland
 Dicranaceae: *Leucoloma* - C. Lafarge-England
 Fissidentaceae - R.A. Pursell
 Grimmiaceae: *Racomitrium* - R. Ochrya
 Hedwigiaceae - E. de Luna
 Hookeriaceae: *Lepidopilum* - S.P. Churchill
 Hookeriaceae: miscell. genera - B. Allen
 Hypnaceae - H. Ando, R.R. Ireland & N. Nishimura

Leucobryaceae: *Leucobryum* - T. Yamaguchi & Z. Iwatsuki
 Leucobryaceae: *Octoblepharum* - N. Salazar
 Orthotrichaceae: Macromitrioideae - D.H. Vitt
 Orthotrichoideae: Orthotrichoideae - J. Lewinski
 Polytrichaceae: *Pogonatum* - J. Hyvönen & M. Menzel
 Polytrichaceae: *Polytrichadelphus* - S.P. Churchill
 Pterobryaceae: *Pirella* - A. Newton
 Rhizogoniacae - S.P. Churchill & C. Matteri
 Seligeriaceae - D.H. Vitt
 Sphagnaceae - H. Crum
 Splachnaceae - A. Koponen
 Thamnobryaceae - I. Sastre-de Jesús

Hepaticae

Cephaloziaceae - J. Vána
 Gymnomitriaceae - J. Vána
 Jungermanniaceae - J. Vána
 Lejeuneaceae: Ptychanthoideae - S.R. Gradstein
 Lejeuneaceae: Lejeuneoideae - B. Thiers, R. Grolle & S.R. Gradstein
 Lejeuneaceae: *Aphanolejeunea* - T. Pócs

Marchantiales - H. Bischler, D. Long et al.

Radulaceae - K. Yamada

Ricciaceae - S. Jovet-Ast

The completion of the very important monograph of the neotropical Plagiochilaceae by Hiroshi Inoue, Tokyo has come to a sudden halt by the untimely death of Dr. Inoue in December 1989. His death is a sad and serious loss to the Flora Neotropica project. At this moment it is being considered whether results of Dr. Inoue's work on the neotropical Plagiochilaceae can be published.

Annual Meeting 1991

The 1991 annual meeting of the Organization for Flora Neotropica will be held in Santa Cruz de la Sierra, Bolivia on May 20th, preceded by a fieldtrip on the 18th and 19th. Anybody interested in the work of the organization may attend the meeting. For further information please contact the organizer: Dr. Stephan Beck, Universidad Mayor de San Andrés, Instituto de Ecología, Correo Central, Casilla 10077, La Paz, Bolivia.

Bryological Explorations in the Kumaun Himalaya

by Giribala Pant and S.D. Tewari

From a vast country like India with a varied and rich bryophyte flora, a great deal of interesting information is still undiscovered. This is especially noteworthy of the 2500 km² Himalayan expanse.

The Western Himalaya comprises the states of Himachal Pradesh, Kashmir and Uttar Pradesh (U.P.). The eight hilly districts of Uttar Pradesh are further collectively referred to as Garhwal (5 districts) and Kumaun (3 districts) Himalaya. The three hill districts (Naini Tal, Almora and Pithoragarh) of Kumaun Himalaya are the home of many bryophytes and have attracted the attention of many explorers and botanists. Starting from the classical

bryophyte collections of Strachey and Winterbottom made in Kumaun during the years 1846-1849 and reported on by Duthie (1906) and subsequently by Mitten (1859) and Brothier (1898), there have been numerous explorations/collections made by many distinguished workers. Yet there are many informational gaps. The Kumaun region has not yet been fully explored from a bryophyte angle. Liverworts have definitely received far better attention but the exquisitely rich moss flora has been rather neglected. Many potential wilderness areas still lie untouched, unexplored or little explored. The collections have been made along regular routes or from easily

accessible areas. There are many glens, valleys, alpine meadows, gorges, marshes, cool humid pockets and mineralized sites that have never been truly explored. Add to this the threat posed by urbanization due to population explosion and we have dwindling areas of bryophytic luxuriance with each passing year! In this scenario, the need for more and more floristic studies emerges as the urgent call of the day. It was to fill this gap that exploratory studies were started in the region in 1979. We have tried to gain an insight into the peculiarities of bryophytic distribution and their substrate preferences in diverse habitats, microhabitats and

continued on p. 6

contd p. 5: **Kumaun Himalaya**

niches in Himalaya (Pant & Tewari, 1983). District Naini Tal was chosen for an assessment of its bryovegetation from the foothills to high altitudes within a range of 326-2600m.

The heterogenous collection of bryophytes from a wide range of substrates are classified artificially into two Synhabitats viz., Terrestrial and Aquatic. Each Synhabitat was divided into Habitats like the Epilithic, Non-epilithic, Epiphytic and Non-epiphytic. In each of these, a number of Subhabitats were recognized, for example, Corticulous and Non-corticulous Subhabitats for the Epiphytic Habitat. Subhabitats were again divided, where necessary, into smaller units - Locations. In all, 2 Synhabitats, 6 Habitats, 60 Subhabitats and 13 Locations were recognised - each with its own bryoflora (Tewari, 1984; Pant & Tewari, 1983, 1984, 1988). A total of 270 bryophyte species including 79 liverworts belonging to 40 genera and 68 species and 191 mosses spread over 107 genera and 184 species have been recorded for district Naini Tal. Out of these, 12 species of mosses belonging to 11 families were reported as new records for India. 20 species of mosses emerged as new additions to the Western Himalayan moss flora (Tewari, 1984). An assessment of the threatened bryophytes of Naini Tal was made (Pant, 1983, 1986). Seven species of thallose liverworts and 2 species of Jungermanniales including 2 monotypic endemics, *Stephensoniella brevipendiculata* Kash. and *Sewardiella tuberifera* Kash. were listed as threatened taxa - rapidly vanishing in a disturbed Himalayan ecosystem. Their rarity was attributed to drastic topographical changes due to fast increasing urbanization, natural and biotopic upheavals, pollution in the hills and overcollection.

The rare, monotypic endemic, Himalayan taxon, *Aitchisoniella himalayensis* Kash. has recently been collected from Orakhan (2000m alti-

tude), Mukteshwar, Naini Tal (unpublished).

This study was further extended to the sister districts of Almora and Pithoragarh. During the period of July 1982 until August 1988, collection trips were made to the bryologically unexplored/underexplored areas of these districts covering an altitudinal range of 900-4000m. The first field trip to Pindari glacier and environs (2200-4000m) yielded a total of 79 mosses (Tewari et al., 1982). The second trip to the Pindari range gave us two of our long-lost thallose liverworts - the monotypic endemic, *Sauchia spongiosa* Kash. and *Preissia quadrata* (Scoop.) Nees - the high-altitude rare taxon having a restricted distribution in India (Tewari et al., 1987).

In all, 129 species belonging to 78 genera of mosses (33 families) and 40 species of liverworts under 40 genera (27 families) have been identified for Almora district. For the sister district of Pithoragarh, 131 moss species spread over 74 genera (32 families) and 33 species of liverworts under 30 genera (19 families) have been recorded. Out of these, 31 species of mosses (14 families) have been added as new records to the list of Western Himalayan moss flora (Pant, 1989).

The dense temperate forests of mixed oak and mixed conifers at an altitude of 2000-3000m in Almora and Pithoragarh districts are a "bryophytic paradise". These zones are characterized by cloudy weather, heavy rainfall and high humidity thus equating the conditions of "cloud" or "mossy" forests of tropical mountains. These are the areas where thorough exploration is needed.

There is much to do and our resources are limited. We appeal for international cooperation in this venture.

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New entries to the IAB Software Library

by Jan-Peter Frahm

Computer Techniques Column. Send contributions to the column editors:

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

Additions to previously published lists (* = the column editor's choice).

In 1990, 110 diskettes have been added to the IAB software library. At present, 350 disks are available. During the past year, 249 copies of disks have been provided to computer using bryologists all over the world, from Moscow to Japan and from Mexico to the Solomon Islands. This is less than in the previous years but only copying took more than 12 hours. In addition, 25 catalogue disks were mailed.

#27, **DOSEDIT**. Command line editor; repeats long DOS commands with a single keystroke. DI: Shows a nice directory on one screen. Used instead of the DOS command "dir".

#163, **CONVINFO**. A dBase program to convert dB-files of the old version of the bibliographic program "info" (#162) into the new version.

#169. Makes the ecotrop database usable with the English version of "Info" on #169.

#177-178. **MegaCad** (shareware).

#183, **ARCE**. Another file compress and decompress program.

#236 **LAB**. Now version 2.1. Change the entry as follows: New version of the herbarium label program on disk #2. Allows you to print up to 60 normal or condensed characters per line, with or without a label header, in one or two adjustable columns to allow printing on sticky labels, with several other facilities such as centred headings, bold and underline, and support for both Epson and Hewlett Packard laserjet printers. With multilingual dialogue, using the Language program (#153).

New Programs:

#239-242 **BSIM**. A software package designed to help develop ecosystem models. It is intended to handle all the difficult parts of programming and let the user focus on translating their ideas into quantitative expressions.

#243, **Mailmaster**. Sets up mail lists, sorts records after different parameters and prints on Epson matrix printers. Runs from floppy disk only. With mailmerge facility for WordStar. Has relatively short fields and an address structure for use in U.S.A.

#244, **Lotus Spreadsheet Templates**.
#245, **Lotus Macros**.

#246-247, **dBase routines**.
ZIPCODES.ARC: Compressed zipcode file for U.S.A.; **FRM2PRG**: Converts a .frm file to a .prg file; **DSCAR**: dBase source code analyser and reporter. Structures dBase programs, displays errors, makes line numbering and cross references of variables and field names.

#248, **PC-Books** (shareware, PC-SIG 901). A menu driven general ledger program, producing financial reports.

#249 **Vaccine**. A collection of 10 Anti-Virus programs.

#250 **Automenu v. 4.5** (shareware). New version of #97, now with DOS command utility and treeview utility.

#251 **Help DOS** (shareware, PC-SIG 686). A Help System for learning and using DOS-commands.

#252-253 **File Express** (shareware, PC-SIG 287-288). A menu driven database management system with mailing list and report generator.

#254 **D-LITE** (shareware, PC-SIG 1204) *. A memory resident (!) program which gives a user access to up to 10 dBase III applications from any other text based program. Comes with

a complete mail list application, which can add, delete, select, print and paste (!) addresses in letters.

#255 **COPILLOT** (shareware, PC-SIG 1020). Desk organizer with calculator, calendar, similar to Borland's "Sidekick".

#256 **Bookminder V. 1.0** (shareware, PC-SIG 1178). Book and journal cataloging system on three levels (standard, research, library, each with different numbers of fields). Many search facilities, with printout. Nicely menu driven, but with relatively short fields for entries and therefore only of limited use for citation of scientific papers.

#257 **3Graph V. 2.01** (shareware, PC-SIG 1163) *. Three dimensional charts, with slide show capability, similar to MS-Charts. Import of ASCII-files (e.g. from datalogger, spreadsheets), output as .PCX format. Various chart types for excellent graphs.

#258 **Anyword** (shareware, PC-SIG 1200). Compiles indices from textfiles, with an index and a finder program.

#259 **4PRINT** (shareware, PC-SIG 1079) *. Laserprinter utility. Prints four pages of text in small font on one sheet of paper, two pages each on one side.

#260 **3x5 Cards** (PC-SIG 1298). Documentation (264 pages) for program on disk # 8.

continued on p. 8

contd p. 7: **IAB Software Library**

- #261 P4UP (shareware, PC-SIG 1460).** Prints 4 60 lines pages on a laserprinter in portrait mode on one sheet of paper. Works like the DOS "print" command and saves lots of paper for printing documentation or listings of programs.
- #262 LETRHEAD (shareware, PC-SIG 1519).** Provides the ability to design logos and to print them on Epson or IBM printers in letter-heads, on envelopes, index cards or labels.
- #263 Charts Unlimited (shareware, PC-SIG 1496).** Creates and prints flow charts, diagrams etc from data in a worksheet.
- #264-266 Viruskiller.** A collection of 25 programs to detect and prevent the action of virus and Trojan Horse programs.
- #267 Speech.** Reads any ASCII textfile either in English or German pronunciation.
- #268 Virus Protection Programs.** ANTIVIR: protects virus infection in the boot sector; PROTEKT: counts checksum of specified files and records any changes; FPAUS: interrupts any connection from floppy drive to harddisk. Allows the testing of dubious software on floppy disk without danger that a possible virus infects the harddisk; VTEST: provides two checksums after two different algorithms to control changes of programs. All programs with German documentation.
- #269 Mac-Conversion.** Converts MacPaint picture files to PC-Paint Plus. Displays pictures on EGE, CGA and Hercules graphics cards.
- #270 Voicemaker.** A program to record digitized voice on the computer. Digitizing is possible only by special hardware. Can be installed in batch-files or programs to which the computer gives voice commands.
- #271 Text & Bilder (freeware).** German program to construct graphs, project plans, structures and flow charts by graphics characters of the ASCII character set so that these graphs can be loaded into an word processor. With numerous sample graphs.
- #272-273 Progressor.** A program in German to develop BASIC programs.
- #274 Disklabels.** LABEL: Prints disk labels in two different sizes; D-ETIKETT: Prints directory on disk label 10x3.5 cm
- #275 Batchfiles.** A collection of batchfiles for various purposes such as password protection, menus etc. Comes with batedi, a texteditor with window technique, especially for batch files.
- #276 Open Access Utilities.** Desk-top utilities for the program "OPEN ACCESS" (Clock, Calendar, notebook, conversion of currencies and measures).
- #277 INFO IV.** Enhanced version of bibliography program on disk #169 for use with dBase IV.
- #278 Micro-Emacs V. 5.42 (freeware).** Texteditor with many features such as copying, moving formatting text, multiple windows etc.; runs also under UNIX.
- #279-283 LATEX (freeware).** Powerful scientific wordprocessor on four HD-disks, PD-version. Requires 4.5 MB on harddisk and 500 K RAM.
- #284 XYPlot 1.0 (shareware).** Displays graphs from data, mouse supported. Imports data from other databases. EGA or CGA required. Emulation does not work.
- #285 Mathplot (shareware).** Function and data plots, statistics (mean and standard deviation, linear regression, correlation coefficient).
- #286 Mathpak II (V.3.0, shareware).** Linear, quadratic equations, statistical functions, logarithms etc.
- #287 Funktionenplot (shareware).** Displays and prints curves from functions. In German.
- #288 Turbo-Plot (shareware).** Similar to #287; archived; in German.
- #289 Diskusp 1.0 (shareware).** Comfortable program for curves with pull down menus, help screen, multiple windows for graphs and values, printing. Supports any functions (also arc, sin, ln, lg etc.). In German.
- #290 Cascade CAD (shareware).** Archived.
- #291 ST-20.** Statistics program with graphics output. In German, with Pascal source code. For CGA, comes with emulation for HGC.
- #292 CommMath.** Archived.
- #293 Active Life 1.0 (shareware).** Special diary program to run under MS-Windows. Comes with a text- and graphics filer, alarms, auto-dialer and pop-up calendar. The filer is better than the MS-Windows desktop utility.
- #294 Draft Choice (Shareware).** CAD program for CGA, EGA or HGC with pull down menus and mouse support.
- #295 Wilson's Windowware (shareware).** Three applications running under MS-Windows 2.03 and higher. COMMAND POST: a menuing / file management shell, replaces the DOS Window but more comfortable; BROWSER: a texteditor, more comfortable than MS notebook; APPLETS: a dozen tiny applications.
- #296 Metz Utilities (shareware, for MS-Windows).** PHONES: database of phone numbers with autodialer; DESKTOPNAVIGATOR: a file utility similar to Norton Commander; DESKTOPMANAGER: similar to Windows Desktop; TIME: digital time display; UNICOM: a terminal program for telecommunication, with host-mode (!) e.g. to access files and programs in another computer hundreds of kilometers away through the phone line.
- #297-8 Windows Utilities 1,2 (shareware).** A dozen utilities for MS-Windows. e.g. EASEL, GCP: programs for displaying, manipulating and converting picture files from and to Windows-Paint, MacPaint, GIF, PCX (PC-Paintbrush); FILEFIND; HUNTER: find files on harddisk; KERMIT: Windows-version of the famous telecommunication program; VIEW: displays and prints files; XVTDRAW: Draw program.

continued on p. 9

contd p. 8: **IAB Software Library**

#299 Window's Desktop (shareware). Like Command Post on #295 but in German.

#300 XLISP Ver. 1.7 (shareware). Programming Language.

#301 LIT Database. Literature database program for input, edit, search and printing of references in German. Comes as dBase III+ program (which can be modified but requires dBase III+) and a compiled version (which cannot be altered but runs as 'exe' file without dBase III+).

#302 Cleanup (Shareware) *. Kills and removes all computer viruses identified by the program SCAN (#237). For the more common viruses (such as Jerusalem, Pakistani, 1701, 1704, Ping Pong etc.) it will even repair the file.

#303 LHARC (freeware) *. File archiving utility with help screen.

#304 Agathe (shareware) *. Most comfortable disk copy program. Copies much faster than the DOS command, automatically verifies copied disk contents. Two disk drives recommended.

#305 Base Maps. Picture files of base maps of Africa, America, the world, and South America in TIF format 150x150 dpi. Can be converted to a variety of other picture formats with the program ICONVERT (#210). The maps can be loaded into Paint Programs and completed with symbols and text.

#306 Campylopus.txt. Text database of bibliographic references on Campylopus. Can be used as unstructured database with the program 3x5 cards (#8).

#307 Diskdup (shareware). Disk-copy program, menu driven, can be setup for any kind of disk drives. Copies HD-disks without changing source and target-disk several times, copies from 5.25" to 3.5" disks and makes several copies from the same disk.

#308 pkz110. Archiving utility.

#309 VShield 63 (freeware for private user) *. Memory resident (!) virus scanner. Prevents boot sector

infections as well as file infections. Monitors and scans programs as they are loaded (!) and prevents infected programs to be executed. Prevents infection of 97 major viruses and 167 varieties. VShield is active automatically each time your system is booted. The most effective antivirus program.

#310 Computer.dbf. Bibliographic database on computer applications in bryology and botany in general. Requires dBaseIII+ and #165INFO.

#311 Germany.dbf. Recent bryological literature on Germany from 1987 on. Will be continuously updated. Requires dBaseIII+ and #165INFO.

#312 Vogesen.dbf. List 720 taxa of bryophytes recorded from the Vosges mountains, France, as dBase file.

#313 Asc2com (shareware). A program that generates a self-listing .com file from an ASCII-text. Useful for readme-files.

#314 PKZIP, PKUNZIP. Archiving program. Archives into a self-extracting .exe file.

#315-317 PC-SIG. Library Catalogue. Catalogue disks for #1484 - 2121 of the famous free- and shareware collection.

#318 PC-Welt Utility Disk. Collection of utility programs, with documentation in German.

#319-320 GT PowerComm (Shareware, PC-SIG 782-783). Communication program which links computers by cable allowing to transfer files, allows communicate with other computer via modem and has a "host mode" for incoming electronic mail.

#321 Mac Paste (PC-SIG 1001). Displays MacPaint picture files on screen with many additional features such as crunching, clipping, squishing, reversing, input of text and printing. Comes with MacShow, a slide show program. Requires EGA or emulation.

#322 Compushow (shareware). Displays .GIF files on screen. Supports all video cards.

#323 Windows Goodies (shareware). Collection of 15 utilities for the use

with MS-Windows, a paint program for icons, a program displaying free RAM, a program which automatically saves files in certain intervals etc.

#324 IAB Telephone, Fax and E-mail directory. Phone, Fax and E-mail numbers as dBase, ASCII, Windows Write and Windows Cardfile files.

#325-330 Recent literature on bryophytes. Recent literature on hepatics 109-120, recent literature on mosses 136-139. The most comprehensive bryological bibliography published in "The Bryologist" in dBase format. Requires dBaseIII+ and for easier use the dBase program "Info" (#234). The separate databases can be merged and allow fast search in any field (author, title, year), also combinations of search criteria. Keyword field is not filled out but may be done additionally.

The Cladistic program "Treesearch" (#156) is now also available for Atari ST computers.

All diskettes of the software library are checked for viruses! Also the computer used for copying disks is checked continuously for virus infections.

A complete catalogue is available by sending a blank 5.25" diskette to J.-P. Frahm, Universität Duisburg, Fachbereich 6, Botanik, Postfach 101503, 4100 Duisburg, F.R. Germany.

New Publications

A. Eddy. 1989. A Handbook of Malesian Mosses, Volume 2: Leucobryaceae to Buxbaumiaceae. Natural History Museum Publications, London, 256 p. ISBN 0-565-01116-2. Price 25 pound sterling.

Keys, descriptions and illustrations are provided of the Pottiaceae, Calymperaceae, Leucobryaceae, Grimmiaceae and some smaller acrocarpous moss families. With the appearance of this volume the treatment of the haplolepidous mosses of Malesia has been completed. Further volumes on the diplo-lepidous groups are awaited. Alan Eddy's Flora is a must for anybody interested in the mosses of Southeast Asia. The work can be ordered from The Natural History Museum, Publications Department, Cromwell Road, London SW7 5BD, U.K.

A.J.E. Smith. 1990. The Liverworts of Britain and Ireland. Cambridge University Press, Cambridge, 362 p. ISBN 0-521-23834-X. Price 45 pound sterling.

A completely new and long-awaited account of the British liverworts and hornworts, replacing the outdated treatment by McVicar 1926. The Flora takes fully account of the present-day viewpoints on European liverwort taxonomy and nomenclature of Grolle and Schuster and others, and provides full keys, descriptions and illustrations of the ca. 300 species recorded from Britain and Ireland.

H.D. Zinsmeister & R. Mues (eds.). 1990. Bryophytes, their Chemistry and Chemical Taxonomy. Proceedings of the Phytochemical Society of Europe. Clarendon Press, Oxford, 470 p. ISBN 0-19-857716-8. Price ca. 30 pound sterling.

This volume contains the results of the international symposium on bryophyte chemistry held in Saarbrücken, 1988. Twenty-nine chapters, written by spe-

cialists from Europe, Japan, U.S.A., New Zealand etc., deal with the results of recent research on chemical composition, physiology and biochemistry, metabolism, chemotaxonomy and pharmacological relevance of bryophytes. This book is the most extensive treatment of the subject and an essential reference for anyone interested in the chemistry and chemo-taxonomy of bryophytes.

M.S. Ignatov. 1990. Upper Permian Mosses from the Russian Platform. Palaeontographica Abt. B, Bnd. 217: 147-189.

This work is a continuation of the important studies on the bryophyte fossils of the Permian of the Ural by Dr. M.F. Neuburg and others. Seventeen species in twelve genera of mosses are being described from these rich Permian deposits, including eight new genera: *Arvildea*, *Gomankovia*, *Aristovia*, *Protoochyrea*, *Viledia*, *Ignatievia*, *Palaeosphagnum* and *Servicktia*. The work provides extensive descriptions and illustrations and is an important contribution to our poor knowledge of the palaeozoic bryophyte flora.

R. Ochrya and P. Szmajda (eds.). Atlas of the geographical distribution of spore plants in Poland. Series V. Mosses (Musci). Part 5. Kraków - Poznań 1990.

This issue of the Atlas contains information on the distribution of ten species, *Geheebia gigantea*, *Dryptodon patens*, *Racomitrium aciculare*, *R. aquaticum*, *R. fasciculare*, *R. lanuginosum*, *Myurella julacea*, *M. tenerrima*, *Plagiothecium undulatum* and *Diphyscium foliosum*. Each species treatment contains comprehensive information about the distribution in Poland and in the world, references, localities, notes and distribution maps. As compared with previous issues the format of this issue has been changed slightly. Copies may be purchased from

the Polish Academy of Sciences, Institute of Botany, Lubicz 46, 31-512 Kraków, Poland, at the modest price of US\$ 14.50.

Nova Hedwigia 51 (1-2), 1990.

This issue of the journal *Nova Hedwigia* contains the results of comprehensive ecological studies on the bryophytes of Mt. Kinabalu, Sabah, Malaysia, carried out in the framework of the BRYOTROP-II project sponsored by the "Deutsche Forschungsgemeinschaft". In six articles (p. 1-164) the following subjects are treated: 1. Epiphytic bryophyte communities of Mt. Kinabalu (Kürschner). 2. The altitudinal zonation of the bryophytes of Mt. Kinabalu (Frahm, Kürschner, 2 articles). 3. Altitudinal distribution of life forms, water storing and water conducting structures of epiphytic bryophytes on Mt. Kinabalu (Frey et al.). 4. Phytomass, substrate ecology and bryophyte growth in relation to light and temperature in the rain forests of Mt. Kinabalu (Frahm, 2 articles). The papers are an important contribution to our knowledge of the ecology of tropical bryophytes.

Bryology and Lichenology in Belgium. Memoires de la Société Royale de Botanique de Belgique 12: 1-150, 1990.

This volume contains the results of a symposium held in the National Botanical Garden of Belgium in Meise, 1988, to celebrate the tenth anniversary of the "Vlaamse Werkgroep Bryologie". The fourteen articles, on subjects ranging from the taxonomy of the bulbiferous *Pohlia* species (Arts) and the distribution of *Eurhynchium praelongum* in deciduous lowland (Hermy et al.) to the use of bryophytes in the evaluation of radioactive fall-out (Guillitte et al.), provide an impression of present-day bryological and lichenological research in Belgium.

Meetings

III Simposio Latinoamericano de Briología, México, 1992

The third Latin American Symposium of Bryology will be held at the Instituto de Biología, on the main campus of the National University of Mexico in Mexico City, on 13-17 July 1992. The title of the Symposium is 'Briología en el Neotrópico'. The symposium will deal with all aspects of Neotropical bryology and will feature two short field trips, lectures and contributed papers. Several social events are also planned. For further information write to the organizer: Dr. Claudio Delgadillo M., III Simposio Latinoamericano de Briología, Apartado Postal 70-367, Delegación Coyoacán, 04510 México, D.F. México.

XV International Botanical Congress, Tokyo, 1993

The 15th International Botanical Congress will be held at the Congress Center of Pacifico, Yokohama, near Tokyo, 28 August through 3 September 1993. The scientific programme consists of plenary lectures, poster sessions and about 240 symposia on all aspects of plant biology. The contributed papers of the congress shall be presented as posters, which will be arranged in poster sessions. Symposia will be based on invited lectures.

Pre- and post-Congress field trips will be arranged throughout Japan as well as in some East and Southeast Asian countries. In addition there will be a number of full- and half-day excursions by bus to local places of scientific, cultural and scenic interest. The traditional 'Nomenclature Session' will take place preceding the congress, from 23 to 27th August.

The bryological programme of the congress will include poster sessions and four symposia. Further activities of interest to bryologists will be announced later.

The first circular of the Congress has appeared November 1990. Those interested to attend the Congress and to

be placed on the mailing list for further circulars should write to the company in charge of the Congress organization: International Communications, Inc. (ICS), Kasho Building 2F, 2-14-9 Nihombashi, Chuo-ku, Tokyo 103, Japan (FAX 81-3-2173-2445). Correspondence concerning general matters of the Congress should be addressed to the Congress Secretariat: Secretariat XV International Botanical Congress, c/o Dept. of Botany, University of Tokyo, 7-3-1 Hongo, Bunkyo-ku, Tokyo 113, Japan. Any suggestions concerning the Congress are welcome and should be sent to the Secretariat.

Requests

Question concerning *Riccia glauca* L., a liverwort endangering the growth of seedlings in a nursery.

by Zhongling Liu

A liverwort specimen has been sent to me from Qi-men County, an afforested area in Anhui Province, eastern China. The sender, Mr. Cheng, a local forestry engineer, wrote in his letter, "a thalloid plant is growing so luxuriantly in our nursery in early July that it covers most of the seedbeds and endangers the growth of seedlings."

The liverwort appears to be *Riccia glauca* L., which is usually found in rice-fields, banks of rivers and other wet habitats in southern Anhui Province. I do not know how we can get rid of this liverwort from the nursery. Can my foreign colleagues offer me some information and suggestions?

Author's address

Shanghai Museum of Nat. History
Botanical Department
1102 Longwu Road
200232 Shanghai, China (PRC)

Request for information on the odor of bryophytes.

Hepatics are known for their characteristic oilbodies which are presumed to be responsible for the characteristic scent of some species. Most bryologists are familiar with the odors of

Lophocolea, *Porella* and others. Regarding mosses much less is known about characteristic odors. Dr. van Zanten informed me about the canned-beans scent of *Pohlia* and Dr. Mues has recorded a cucumber aroma in *Cirriophyllum crassinervum*. I am interested to collect information on the odor of liverwort and moss species and to communicate it to the readers of *The Bryological Times*. It could help identification of difficult species in the field. If you have made any such observation, please write to Dr. Klaus von der Dunk, Ringstrasse 62, 8551-Hemhofen, Germany.

Note from the editor: A brief review of the odors of bryophytes and the chemical substances responsible has recently been published by Y. Asakawa, in: H.D. Zinsmeister & R. Mues (eds.), *Bryophytes, Their Chemistry and Chemical Taxonomy*, p. 370-376 (see this issue of the *Times*, p. 10)

Personalia

New Curator Herbarium Strasbourg

In recent years the Herbarium of the University of Strasbourg (STR), which is the 6th largest Herbarium in France and houses numerous classical collections including the liverwort types of Nees von Esenbeck, has suffered from neglect due to the lack of a curator. The importance of this herbarium has recently been emphasized in the national newspaper *Le Monde* by Hoff & Gradstein (1989 and in press) and elsewhere. The recent attention and publications have resulted in the appointment of a new curator who will deal with all loan requests from 1991 onwards: Dr. Francoise Dreger-Jauffret, Herbar, Institut de Botanique, 28 Rue Goethe, F-67083 Strasbourg Cedex, France.

References:

- Hoff, M. & Gradstein, S.R. [1989]. L'herbier Louis-Pasteur, une richesse à exploiter. *Le Monde*, 9 November.
———, in press. L'Herbier de l'Université Louis-Pasteur de Strasbourg. *Taxon*.

Colophon

The Bryological Times, founded in 1980 by Stanley Wilson Greene (1928–1989), is the bimonthly newsletter of the INTERNATIONAL ASSOCIATION OF BRYOLOGISTS. It is published in Edmonton (Canada) and distributed from Canberra (Australia), Edmonton (Canada), Eger (Hungary), Geneva (Switzerland), Hiroshima (Japan), Moscow (U.S.S.R.), Praha (Czechoslovakia) and St. Louis (U.S.A.).

Important change from no. 57/58 onwards: all items for publication in *The Bryological Times* are to be sent, preferably on diskette, to the Managing Editor, Guido B.A. van Reenen, University of Amsterdam, Hugo de Vries Laboratorium, Kruislaan 318, 1098 SM Amsterdam, the Netherlands, **except** those for the regular columns, which may go **direct** to the column editors.

General Editor
S.R. Gradstein, Utrecht

Managing Editor
G.B.A. van Reenen, Amsterdam

Assistant Editor
P.W.A. Greene, Bilthoven

Column Editors
W.R. Buck & J. Vána (floristics and phytogeography); J.-P. Frahm & B. O'Shea (computer techniques); J.M. Glime (ecology); D. Griffin III (tropical bryology); R. Mues & J.G. Duckett (research and development); R. Perry (collections); M.L. Sargent (techniques); E. Urmi & T. Hallingbäck (endangered bryophytes); D.H. Vitt (diary, best book buys, taxonomy); G. Zijlstra (nomenclature)

Correspondents
R.D. Seppelt (Australasia); B.C. Tan (East Asia)

For details regarding membership of the INTERNATIONAL ASSOCIATION OF BRYOLOGISTS (currently US \$10.00 p.a.) write to the Honorary Secretary, Dale H. Vitt, Department of Botany, University of Alberta, Edmonton, Alberta, Canada T6G 2E9. All correspondence concerning mailing to Sandi Vitt at the same address.

Diary

Send contributions to D.H. Vitt,
University of Alberta, Department of Botany, Edmonton, Alberta, Canada T6G 2E9.

1991

April 3-10. BBS Spring Field Meeting. Clevedon, U.K. Inquiries: Peter Martin, 37 Hughenden Road, Horfield, Bristol BS7 8SF, U.K. Tel. 0272 240355.

April 11-13. International symposium on the physiology, developmental biology, cell biology, cell biology and genetics of bryophytes in Heidelberg, Fed. Rep. of Germany. Inquiries: W.O. Abel, Universität Hamburg, Ohnhörstrasse 18, D-2000 Hamburg 52, Germany, B.R.D.

July 5-12. Nordic Bryological Society Annual Meeting. Kongsvald, Norway. Twenty-fifth anniversary meeting. Inquiries: Gert Mogensen, University Botany Museum, Gothersgade 130, DK-1123, Copenhagen K, Denmark.

July 17-18. IAB Symposium: The Biology of Sphagnum. Exeter, U.K. Symposium preceded by field meeting on July 12-16. Contributed papers are invited. Offers of papers and inquiries should go to R. E. Daniels, Institute of Terrestrial Ecology, Furzebrook Research Station, Wareham, Dorset BH20 5AS, U.K. Tel. 09295 51087.

July 19-23. IAB/BBS Joint Meeting on Experimental Bryology, Exeter, U.K. Symposia, contributed paper sessions and field days. Offers of papers and inquiries should go to M.C.F. Proctor, Hatherly Laboratories, The University, Prince of Wales Road, Exeter EX4 4PS, U.K.

Aug. 4-8. Bryological and Lichenological Section of the Botanical Society of America. Annual meeting with the American Institute of Biological Sciences. Convention Center and Trinity University, San Antonio, Texas. Inquiries: Ann Rushing, Department of Biology, Baylor University, Waco, Texas 76798, U.S.A.

Aug. BBS Summer Field Meeting, Massif Central, France. To be held probably during the third week of August. Inquiries: Roy Perry, Department of Botany, National Museum of Wales, Cardiff CF1 3NP. Tel. 0222 397951, Ext. 267.

Sept. 14-15. BBS Annual General Meeting and Symposium Meeting, Sheffield, U.K. Inquiries: Tom Blockeel, 9 Ashfurlong Close, Dore, Sheffield, S17 3NN. Tel. 0742 366861.

Late Sept. Australian Bryological Workshop, Canberra, Australia. Tentative dates are for the 21st to 30th. Inquiries: Heinar Streimann, Cryptogamic Herbarium, Australian National Botanic Garden, Canberra, A.C.T. 2601, Australia.

Oct. 11-13. BBS Bryophyte Workshop, Rogate, West Sussex. Inquiries: June Chatfield, 44 Ashdell Road, Alton, Hampshire GU34 2TA. Tel. 0420 82214.

1992

July 13-17. III Simposio Latinoamericano de Biología, México. Inquiries: Dr. Claudio Delgadillo M., Apartado Postal 70-367, Delegación Coyoacán, 04510 México, D.F. México.

1993

August 28 - September 3. XV International Botanical Congress, Tokyo. (see for details *The Bryological Times* 59: 11)

INTERNATIONAL ASSOCIATION OF BRYOLOGISTS
BRITISH BRYOLOGICAL SOCIETY

FIRST INTERNATIONAL SYMPOSIUM ON THE
BIOLOGY OF SPHAGNUM

AND

THE I.A.B. BIENNIAL MEETING :
EXPERIMENTAL BRYOLOGY

University of Exeter, U.K.
12-24 July 1991

Outline Programme and Booking Form

The University of Exeter is situated on a spacious and beautiful campus on the north side of the City. Accommodation will be in single study-bedrooms in the Duryard Halls of Residence, Cowley Bridge Road, about a mile from the main campus, where the paper-reading sessions will take place in the Hatherly Laboratories. Exeter, the regional centre, is a pleasant city with a population of about 100 000. It provides a good range of hotel and bed-and-breakfast accommodation (early booking is advisable in summer), and a diversity of places for eating out. A detailed programme and further information about the University and the City will be sent in due course to all those who have booked for the meetings.

Final date for booking residential
accommodation, 30 April 1991

129B

THE INTERNATIONAL ASSOCIATION OF BRYOLOGISTS and
THE BRITISH BRYOLOGICAL SOCIETY
FIRST INTERNATIONAL SYMPOSIUM ON THE BIOLOGY OF SPHAGNUM and
THE I.A.B. BIENNIAL MEETING : EXPERIMENTAL BRYOLOGY.
UNIVERSITY OF EXETER, U.K., 12-24 JULY 1991.

Outline Programme

12-16 July: Field excursion emphasising Sphagnum, starting in Glasgow and ending in Exeter. See separate circular and booking form; approximate cost including transport, accommodation and meals, £185.

17-18 July: THE BIOLOGY OF SPHAGNUM. Sessions devoted to particular aspects of the biology of Sphagnum will include invited contributions and offered papers.

Wed. 17 July Prof. H.Sjors (special paper). Taxonomy & Systematics, R.E.Andrus. Biogeography, A.Eddy, D.Lane. Population Genetics, R.Daniels, C.McQueen. Physiology, H.Rudolph.

Thu. 18 July Ecophysiology, J.M.Glime, J.A.Lee. Ecology, K.Dierssen, H.Rydin. Peat-forming Systems, J.Janssens, N.Malmer. Sphagnum and Man, P.Pakarinen. Prof. R.S.Clymo (special paper).

19-24 July: EXPERIMENTAL BRYOLOGY. There have been major advances in recent years in many aspects of experimental bryology, which the meeting will seek to explore and integrate. Sessions will include both invited and offered papers.

Fri. 19 July Biochemistry and Metabolism, N.Smirnoff. Cell biology and fine structure, J.G.Duckett.

Symposium Dinner in Reed Hall ***

Sat. 20 July Free day. An opportunity to look round the old Cathedral city of Exeter, or to see something of the varied surrounding country and coastline.

Sun. 21 July Field excursion to granite tors, moorland and oak-woods on Dartmoor. A good range of Atlantic bryophytes should be seen during this visit to a varied upland area west of Exeter.

Mon. 22 July Reproduction and Control of Development, D.V.Basile. Ecophysiology and Experimental Ecology, L.Kappen, J.W.Bates.

Social evening, including demonstration of Morris Dancing.

Tue. 23 July Biosystematics and Population Biology. Pollution and Conservation, J.A.Lee.

24 July Field excursion to dry and wet heath on Triassic pebble beds, and calcareous woodland on landslipped coast in East Devon. A visit to two very different bryologically interesting sites which contrast with the 'hard rock' area visited on 21 July.

BOOKING FORM: I.A.B. - B.B.S. Meetings, Exeter, U.K. July 1991.

CONFERENCE FEE
Biology of Sphagnum, £15; Experimental
Bryology, £25; both meetings, £35 Cost £ p

ACCOMMODATION (prices include VAT at 15%)
Lunch (£5.20) Dinner (£8.00) Bed & Breakfast (£21.10)

Tue. 16 July	. . .	. . .	. . .
Wed. 17 July	. . .	. . .	. . .
Thu. 18 July	. . .	. . .	. . .
Fri. 19 July	. . .	. . .***	. . .
Sat. 20 July	. . .	. . .	. . .
Sun. 21 July	. . .	. . .	. . .
Field excursion, Dartmoor (£4.00)			
Mon. 22 July	. . .	. . .	. . .
Tue. 23 July	. . .	. . .	. . .
Wed. 24 July	. . .	. . .	. . .
Field excursion, East Devon (£4.00)			

TOTAL

Name(s)..... Title..... Sex.....

Address.....

Any special dietary (or other) requirements

Please complete and return this form with remittance (cheques payable to IAB/BBS Conference A/C) to IAB/BBS Conference, Dept of Biological Sciences, Hatherly Laboratories, Prince of Wales Road, EXETER, EX4 4PS, U.K., by 30 April 1991.

I wish to offer a poster/exhibit entitled.....
..... requiring sq.m. wall/bench space