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No. 43

BRYOLOGICAL RESEARCH IN HELSINKI 1976 - 1986

By Timo Koponen

A REVIEW of the bryological research carried out in the University of Helsinki was given some 10 years ago (Bull. Bryol. IX, In Taxon 25: 365-366, 1976). The present report covers the last 10 years and tells of the progress made in this time. It also outlines current research projects.

There have been some changes both in the staff of the botanical Museum and in the research staff, with some younger bryologists emerging (Fig. 1). Professor Heikki Roivainen, the Emeritus Head Curator of the Cryptogamic Herbarium, died in 1983 (Crypt. Bryol. Lichenol. 6: 77-78). The author of this report left the herbarium to take up the position of Professor of Botany from the beginning of 1986: at the time of writing (December 1986) his successor as Head Curator has not been announced. In any case, Dr. Pekka Isoviita will continue as a curator in the herbarium. Doc. Sinikka Piippo was appointed as an assistant in the Department of Botany, but she continues as acting junior curator of the Museum until the office of Head Curator is settled. Prof. D.H. Norris from Arcata, California, has taken up semi-permanent residence in Helsinki, and in the Botanical Museum.

Three theses have been presented for Ph.D.: by Lai Ming-Jou on the taxonomy and floristics of the mosses and lichens of Taiwan (Publ. Dept. Bot. Univ. Helsinki, 9: 1-40); by Aune Koponen, the Curator of HSI, on the taxonomy of Splachnaceae, (Publ. Dept. Bot. Univ. Helsinki, 11: 1-48) and by S. Piippo on the taxonomy of *Lepidojeunea* and *Luteolejeunea* (Acta Bot. Fennica, 132: 1-69).

Young bryologists include Mr. Jaakko Hyvönen, M.Sc., who is studying the family Polytrichaceae, especially the genus

Pogonatum for his Ph.D. thesis; Mr. Krister Karttunen, M.Sc. who is working on the nomenclature and biology of Finnish bryophytes and Johannes Enroth who is currently writing his thesis for a master's degree on the Neckera-ceae of Western Melanesia.

In addition to the taxonomically-oriented research described above, others are working in the fields of bryophyte physiology and bryophyte ecology in the Department of Botany of Helsinki University. Much of this work is centered around the pollution and contamination caused by heavy metals. Prof. Liisa Simola has studied the heavy metal problems of *Sphagnum fimbriatum* (e.g. Ann. Bot. Fennici, 14: 1-5; J. Hattori bot. Lab., 43: 365-377) and fatty acid composition of this taxon (Physiol. Plant., 50: 74-77). Dr. Pekka Pakarinen has worked on ecological indicators and species groups of peatland bryophytes, and on heavy metal distribution in the *Sphagnum* layer of bogs (e.g. Ann. Bot. Fennici, 15: 287-292). Lic. Ahti Mäkinen has studied heavy metal monitoring using *Hylocomium splendens* and air pollution monitoring using *Sphagnum* moss-bags (Abstr. Acta Bot., 9 (Suppl. 1): 24).

In the 1980's we have seen many visitors in Helsinki, some of whom have stayed with us for a long time. They include Dr. Lai Ming-Jou, Dr. Benito Tan, (Laguna, Philippines), Mr. Li Zhi-hua (Guangzhou), Mrs. Li Xing-jiang (Kunming), Mrs. Lou Jian-shing (Beijing), Prof. Gao Chien (Shenyang) and Dr. Bronislaw Wojtuś (Wrocław). Mrs. Lin Pan-juan from Guangzhou (South China Institute of Botany) will be staying with us from the beginning of January 1987. The visitors have been very successful in their research as exemplified by the following: B. Tan's revision of *Dicranoloma* (Ann. Bot. Fennici, 20: 317-334), Lou's

[continued on page 3.]

TOWARDS AN ILLUSTRATED

MOSS FLORA OF EGYPT

By Afaf A. Badawi

UP UNTIL NOW, there have only been about 25 different investigations of Egyptian mosses, none of which have been in any way comprehensive. Additionally, several regions in the country still require bryological exploration. Taken together, these facts show that the preparation of an illustrated moss flora of Egypt still has a long way to go.

One of the essential requisites is to have available an appropriate herbarium. Much effort has, therefore, been made by Waqieh El Saadawi and his associates to establish such an herbarium at Cairo (CAIA). This now includes about 2,000 samples representing about 200 different entities. The majority of specimens are of Egyptian mosses, but a few are European. Although it is beyond our present ambitions to develop an international moss herbarium, the exchange of specimens with other herbaria is being encouraged to establish a base of reference material to facilitate the identification of newly-collected bryophytes. The growth of mosses in Egypt is not luxuriant and as most of the taxa lack sporophytes or even developed sex organs, most Egyptian moss samples at present available for exchange are not very encouraging due to their small quantity.

Phytogeographically, only the northern part of Egypt can be considered as part of the southern mediterranean region. It gets ca. 200 mm annual rainfall and has many elements in common with the Algerian-Tunisian-Libyan angiosperm flora. But most of Egypt, that is over 96% of its area, is almost a rainless desert. For example, the annual rainfall in Cairo is only ca. 20 mm and in El-Fayum about 10 mm. However, the limited areas of the Nile Valley, Nile Delta, El Fayum Depression, as well as the Oases of the Libyan desert, claim comparatively abundant water

[continued on page 2.]

Moss Flora of Egypt [contd. from p. 1.]

supplies. In the case of the first three areas this water is derived from the Nile: it comes from artesian springs in the case of the Oases. The Sinai region south of El-Tih desert is a mountainous area with a much cooler climate with snow forming on the mountain tops in winter. Here the annual rainfall is greater than in many other regions in Egypt, i.e. ca. 40 mm. The Gebel Elba range is another high mountainous region in the extreme south-eastern corner of the country and it has an angiosperm flora different from any other part of Egypt (see Täckholm, 1932).

In summary the most distinct phytogeographical regions of Egypt are (i) the desert region, which includes the Western (Libyan) desert, the Isthmic desert and the Eastern (Arabian) desert; (ii) the Mediterranean Coast; (iii) the Red Sea Coast; (iv) Sinai proper (south of El-Tih desert); (v) the Nile region (Nile Valley, Nile Delta and El-Fayum Depression); (vi) the Oases of the Libyan desert; and (vii) the Gebel elba region.

For the preparation of a representative moss flora of Egypt all these phytogeographical regions should be surveyed bryologically. The inclusion in the moss flora of introduced species should also be considered. Apart from natural migration, mosses are likely to get "imported" via cities serving as international ports, e.g. Cairo, Alexandria, Suez, etc., with horticultural products such as peat moss, plants, etc.

Egypt is one of the regions where mosses predominantly reproduce vegetatively. Sporophytes have been reported so far in only about 20% of the recorded taxa. Even in those mosses which produce mature spores, we do not know whether they are responsible for the propagation of new plants. The commonest breeding system among Egyptian mosses is probably apomixis. Continuous vegetative reproduction eventually alters the limits of species so that some intergrading is likely to be found in future generations. Thus taxa based on moss clones or populations, built up by vegetative reproduction, that are hybrid in origin, may result in taxonomic confusion (see Heywood, 1967). The danger is that without satisfactory recognition procedures scores of "apomictic species" could be described as new entities.

The production of a moss flora of Egypt thus presents

two major problems. The first results from the fact that Egypt is still very inadequately surveyed for mosses, while the second is that many taxa can only be identified provisionally. Thus it seems that a flora can only be achieved in several stages involving some temporary phases.

The presentation of keys at each stage would not only be difficult, depending as they would have to on gametophytic characters, but be of limited use, since the discovery of additional taxa would render the keys unsatisfactory. For example, the conservation of *Barbula ehrenbergii* (Lör.) Fleisch, over *Didymodon ehrenbergii* (Lör.) Kindb., would require changes in the keys to species of these two genera. So it seems better to adopt a non-conventional approach and to present a descriptive account of each part of the country as it is surveyed. This approach should suit our present-day knowledge of Egyptian mosses and accommodate any future additional information concerning new records or any nomenclatural changes. It would also allow for flexibility and provide the interested bryologist with a full description of each entity.

By using such a non-conventional approach a certain set of well-defined characters will be recorded for each moss for each area. At the time of writing, such a set of characters has been devised and is almost complete. In this way characters of all collected mosses can be presented in a tabulated form for each region investigated. These tables, with accompanying photographs, will give a detailed picture of each taxon and facilitate identification of material in the absence of keys. Furthermore, such tabulated presentations are prerequisites for computer assessments, or punch-card systems, which may be available at a future date. From such tabulated presentations, based on the same set of characters, of the mosses of each region in Egypt, a standard flora for the whole country can, in time, be prepared.

The second problem is the unavoidable necessity for some provisional identification of taxa until their true identity is discovered. The absence of the sporophyte in the majority of Egyptian taxa, the occurrence of intergrading species, inadequate literature and lack of an adequate sample of authentic specimens, all impose difficulties in identifying mosses. But can we neglect the entities we fail to identify? Some of these may turn out to be new taxa.

It seems imperative there-

fore to follow Agnew's (1974) attitude, as encouraged by Greene (1976) to use the temporary measure of giving numeric notations when referring to the descriptions of unknown entities (e.g. *Barbula* 1, *Barbula* 2 or *Pottioideae* 1, *Pottioideae* 2 where the genus is unsure, rather than traditional binomials. This is mainly a precaution since some or all of these entities may be "specimen species" (sensu Greene, 1976) and not true biological species in that the variation exhibited by the specimens is regional, and has no proper taxonomic significance. It is suggested that such temporary notations may be used in the descriptions of entities from regions not previously explored, or where very few specimens are available. Thus procedure should be retained for a suitable period (at least ten years?) after publication before a formal naming takes place, unless it can be proved that the entity represents a definite biological taxon before that time. Once these entities are formally named, the provisional "numeric notations" can be discarded. Of course these entities would become recognized as normal taxa once they had been formally given binomials.

References

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- Greene, S.W. 1976. Are we satisfied with the rate at which bryophyte taxonomy is developing? *J. Hattori bot. Lab.* 41: 1-6.
- Heywood, V.H. 1967. Plant taxonomy. (Institute of Biology's Studies in Biology No. 5.) London, Edward Arnold (Publishers) Ltd.
- Täckholm, V.L. 1932. Bibliographical notes to the flora of Egypt. *Festskrift till Verner Söderberg den fjärde*, 1932: 210.
- Botany Department, Faculty of Science, University of Ain Shams, Abbasiya, Cairo, Egypt.
- [An earlier article by El-Saadawi (1981) reported the start of work on the moss flora of Egypt - see *Bryol. Times*, 11:5-6. Editor.]

NEW EXSICCATES

- Bryophyta Vogesiaca Exsiccata*
Ser. 3-4, Nrs. 51-100
- Campylopodex Exsiccatae*
Fasc. 5, Nrs. 101-125
- Campylopodex Malaysiae Exsiccatae*

All exsiccate series in sets of 50 duplicates, available on exchange basis from: J.-P. Frahm, University Duisburg, Fachbereich 6, Botanik, Postfach 101629, D-4100 Duisburg, F.R.G.

Bryological Research in Helsinki
(continued from page 1.)

revision of Chinese *Atrichum* (Ann. Bot. Fennici, 23:33-47) and Li Zhi-hua's monograph of Chinese *Fissidens* (Acta Bot. Fennica, 129: 1-65).

In the previous paper there were 9 research projects listed, some of which have been completed or discontinued; others are being continued and some new ones have been started.

1. P. Isoviita continues his studies on the nomenclature of bryophytes and has enlarged his studies to groups other than *Sphagnum*.

2. An annotated checklist of Finnish bryophytes has been published (Flora Fennica, 6: 1-77) and with new additions and records being filed continuously, an addendum will be published.

3. I. Järvinen's studies on the taxonomy, distribution and nomenclature of Finnish *Plagiochila*, *Lophocolea* and *Chiloscyphus* (e.g. Ann. Bot. Fennici, 20: 87-99) have been completed.

4. A. Koponen continues her studies on the Splachnaceae and Splachnobryaceae.

5. The worldwide treatment of the taxonomy and nomenclature of the Mniaceae has been completed by T. Koponen. The final monograph will, hopefully, be written one day.

6. As to the boreal and temperate floras, in addition to those of Finland, the East Asiatic floras, especially those of China, are being focused upon.

7. The moss flora of Kymenlaakso in south-east Finland was completed by the late Prof. V. Kujala et al. (Acta Bot. Fennica, 109: 1-34).

8. Very little recent work has been done with the moss flora of Patagonia. However, a Finnish expedition which includes a bryologist (J. Hyvönen) has been exploring in Tierra del Fuego from December 1986 to March 1987.

9. The study of moss spores has been discontinued.

The most demanding task currently being undertaken by the Helsinki group of bryological taxonomists concerns a project we call "Bryophyte flora of Western Melanesia". The area we are studying includes West Irian, Papua New Guinea and the Solomon Islands. All published bryophyte names for this area are being checked.

The project was begun in 1981 when D. H. Norris and T.

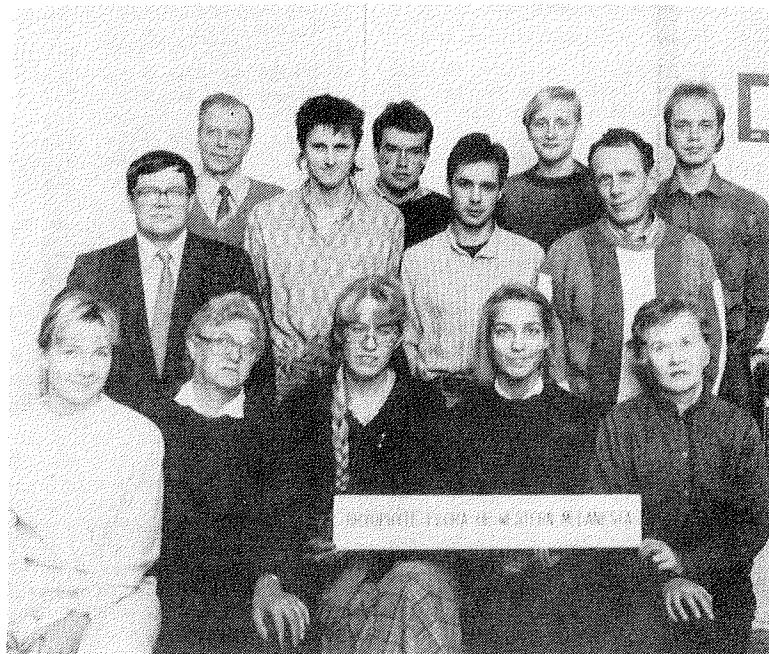


Figure 1. The Helsinki participants of the bryophyte flora of Western Melanesia Project, the staff of the bryological herbarium and some students of the Department of Botany. Names by row from the left. Front row: Jaana Turkia, M.Sc., diatoms; Mrs. Sigbrith Launos, technician; Doc. Sinikka Piippo, acting junior curator, hepatics; Soili Stenroos, M.Sc., Cladoniaceae of Melanesia; Dr. Aune Koponen, curator of HSI, Splachnaceae and Splachnobryaceae. Second row: Prof. Timo Koponen, mosses; Veli Mäkkärinen, B.Sc., *Dicranum* in Finland; Johannes Enroth, Neckeraceae; Prof. Daniel H. Norris, mosses. Third row: Doc. Pekka Isoviita, acting head curator, *Sphagnum*; Jaakko Hyvönen, M.Sc., Polytrichaceae and Pterobryaceae; Jouko Rikkinen, phytogeography of tropical SW Asia; Krister Karttunen, M.Sc., acting assistant, nomenclature and biology of mosses.

Koponen made an excursion to Papua New Guinea. This expedition was sponsored by the Academy of Finland and University of Helsinki and these institutions continue to fund the project. Funds were also received from the Finland-United States Educational Exchange Commission, and several Finnish foundations.

The 17,000 specimens collected have been studied, and the results are being published steadily. T. Koponen and D.H. Norris are responsible for the mosses and S. Piippo for the hepatics. The colleagues who have helped us by identifying our material and co-authoring published papers include: J.-P. Frahm, M. Geise, R. Grolle, S. Hattori, H. Inoue, N. Kitagawa, M. Mizutani, N. Nishimura, M. Padberg, W.D. Reese, A. Touw, J. Vana, D.H. Vitt and Y. Yamada.

The results are appearing in Finnish botanical journals under 3 general titles:

(i) The Annotated catalogue series which contains the checklists. The hepatic list has been published (see below) and the list of mosses will be published when the major part of the taxa have been revised;

(ii) The Frieda River series, which contains floristic papers based on Koponen's collections in the Sepik area;

(iii) The Huon Peninsula series, which contains monographs and revisions.

When completed, the Huon series will form a bryophyte flora of the area. The humble name for the series was selected in the beginning of the revisions when we could not yet predict the scope of our findings. We estimate now that more than half of the work has been done. A total of 22 papers has been published so far (see the list below), several have been sent to press and 5 to 10 manuscripts will be completed soon.

The following papers have appeared so far as part of our Western Melanesian bryoflora project:

The ANNOTATED CATALOGUE series:

Grolle, R. & S. Piippo, 1984. Annotated catalogue of Western Melanesian bryophytes. I. Hepaticae and Anthocerotae. *Acta Bot. Fennica*, 125: 1-86.

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Bryological Research in Helsinki :
[continued from page 3.]

The HUON PENINSULA series:

1. Koponen, T. & D.H. Norris. 1983. Bryophyte flora of the Huon Peninsula, Papua New Guinea. I. Study area and its bryological exploration. *Ann. Bot. Fennici*, 20: 15-29.
2. Koponen, T. & D.H. Norris. 1983. Bryophyte flora of the Huon Peninsula, Papua New Guinea. II. Mniaceae (Musci). *Ann. Bot. Fennici*, 20: 31-40.
3. Piippo, S. 1984. Bryophyte flora of the Huon Peninsula, Papua New Guinea. III. Haplomitriaceae, Lepicoleaceae, Herbertaceae, Pseudolepico-leaceae, Balantiopsaceae, Pleuroziaceae, Lepicoleaceae (Hepaticae). *Ann. Bot. Fennici*, 21: 21-48.
4. Koponen, T. & D.H. Norris. 1984. Bryophyte flora of the Huon Peninsula, Papua New Guinea. IV. *Anomobryum*, *Bryum* and *Rhodobryum* (Bryaceae, Musci). *Ann. Bot. Fennici*, 21: 265-290.
5. Grolle, R. & S. Piippo. 1984. Bryophyte flora of the Huon Peninsula, Papua New Guinea. V. Lepidoziaceae subfam. Zoopsoideae and Cephaloziaceae subfam. Schiffnerioideae (Hepaticae). *Ann. Bot. Fennici*, 21: 299-307.
6. Piippo, S. 1984. Bryophyte flora of the Huon Peninsula, Papua New Guinea. VI. Lepidoziaceae subfam. Lepidozioidae, Calypogeiaceae, Ad-elanthaceae, Cephaloziaceae and subfam. Odontoschismatoidae and Jubulaceae (Hepaticae). *Ann. Bot. Fennici*, 21: 309-335.
7. Norris, D.H. & T. Koponen. 1985. Bryophyte flora of the Huon Peninsula, Papua New Guinea. VII. Trachypodaceae, Thuidiaceae and Meteoraceae. *Acta Bot. Fennica*, 131: 1-51.
8. Koponen, T. & D.H. Norris. 1985. Bryophyte flora of the Huon Peninsula, Papua New Guinea. VIII. Hylocomiaceae and Rhytidiaceae. *Acta Bot. Fennica*, 131: 53-61.
9. Frahm, J.-P., Geise, M., Pad-berg, M., Koponen, T. & D. H. Norris. 1985. Bryophyte flora of the Huon Peninsula, Papua New Guinea. IX. *Atractylocarpus*, *Bryohumbertia*, *Campylopodium* and *Campylopus* (Dicranaceae, Musci). *Acta Bot. Fennica*, 131: 63-88.
10. Piippo, S. 1985. Bryophyte flora of the Huon Peninsula, Papua New Guinea. X. Jackielaceae, Scapaniaceae, Arneliaceae and Acrobolaceae (Hepaticae). *Acta Bot. Fennica*, 131: 89-96.
11. Koponen, T. & D.H. Norris. 1985. Bryophyte flora of the Huon Peninsula, Papua New Guinea. XI. *Brachymerium*, *Epip-terygium*, *Leptobryum*, *Mielichhoferia*, *Orthodontium*

and *Pohlia* (Bryaceae) and *Leptostomataceae* (Musci). *Acta Bot. Fennica*, 131: 97-127.

12. Piippo, S. 1985. Bryophyte flora of the Huon Peninsula, Papua New Guinea. XII. Geocalycaceae (Hepaticae). *Acta Bot. Fennica*, 131: 128-167.
13. Piippo, S. 1985. Bryophyte flora of the Huon Peninsula, Papua New Guinea. XIII. *Arachniopsis* and *Kurzia* (Lepidoziaceae subfam. Lepidozioidae Hepaticae). *Acta Bot. Fennica*, 131: 168-179.
14. Koponen, T., Touw, A. & D.H. Norris. 1986. Bryophyte flora of the Huon Peninsula, Papua New Guinea. XIV. Rhizogoniaceae (Musci). *Acta Bot. Fennica*, 133: 1-24.
15. Hattori, S. & S. Piippo. 1986. Bryophyte flora of the Huon Peninsula, Papua New Guinea. XV. *Frullania* (Frullaniaceae, Hepaticae). *Acta Bot. Fennica*, 133: 25-58.
16. Grolle, R. & S. Piippo. 1986. Bryophyte flora of the Huon Peninsula, Papua New Guinea. XVI. Pallaviciniaceae (Hepaticae). *Acta Bot. Fennica*, 133: 59-79.
17. Koponen, T. & D.H. Norris. 1986. Bryophyte flora of the Huon Peninsula, Papua New Guinea.

nea. XVII. Grimmiaceae, Hed-wigiaceae and Racopilaceae (Musci). *Acta Bot. Fennica*, 133: 81-106.

18. Hyvönen, J. 1986. Bryophyte flora of the Huon Peninsula, Papua New Guinea. XVIII. Polytichaceae and Buxbaumiaceae (Musci). *Acta Bot. Fennica*, 133: 107-150.
19. Reese, W.D., Koponen, T. & D.H. Norris, 1986. Bryophyte flora of the Huon Peninsula, Papua New Guinea. XIX. *Calym-peres*, *Syrropodon* and *Mit-thyridium* (Calymperaceae (Musci). *Acta Bot. Fennica*, 133: 151-202.

The FRIEDA RIVER series:

- Norris, D.H. & T. Koponen, 1985. Bryophytes from Frieda River, East and West Sepik Provinces, Papua New Guinea. I. Musci. *Ann. Bot. Fennici*, 22: 367-396.
- Piippo, S. 1985. Bryophytes from Frieda River, East and West Sepik Provinces, Papua New Guinea. II. Hepaticae (Haplomitriaceae - Frullaniaceae). *Ann. Bot. Fennici*, 22: 1-10.

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VLAAMSE WERKGROEP BRYOLOGIE

Report on the Annual General Meeting held at Meise,

14 February, 1987

I. Alteration of the Statutes

Because less than two-thirds of the members were present, no alteration could be decided. An Extraordinary General Meeting will be held on 4 April, 1987, when the matter will be raised again.

II. Activities in 1986

1. A brief description was given with an evaluation of past activities.

2. Muscillanea: A discussion on M5 and M6 (publishing date, March 1987) revealed that as the Plantentuin at Meise cannot publish Muscillanea any longer, the Working Group will have a very hard extra financial cost every year!

3. Statement of accounts: Attention was drawn to the fact that members in European countries can pay their 150 BF subscription (now due) by Eurocheque to W. Van Rompu, Bosstraat 86, B-9180 Belsele. Total expenses in 1986 were 8,902 BF which included 7,086 BF for stamps!

4. Library: A list of acquisitions was presented.

5. Board of the Working Group: Two members were re-elected.

III. Miscellaneous

1. A warden of a nature reserve in Koersel (Limburg) asked for advice before starting some changes.

2. It was reported that a laundry near Antwerp has trouble in its cisterns caused by *Rhynchosstegium ripariodes*.

3. The Working Group is going to design an information document, and will ask members for suggestions.

IV. Activities for 1987

Attention was drawn to changes in the dates of two meetings: Buggenhout (on 3 March) and De Maten (now 3 October)!

Further information for foreign participants can be obtained from Herman Stieperaere, Nationale Plantentuin, Domein van Bouchout, 1860 Meise (Tel. 02/2693905 or 02/2697985 private).

V. Projection diapositives by Theo Arts

One of the most active members of our Working Group presented us with the results of his trip to western Ireland.

Ludo Smets, Secretary, Vlaamse Werkgroep Bryologie, A. Van Dijkstraat 13, B-2300 Turnhout, Belgium.

A Bryohistorical Landscape of the German Democratic Republic

showing the main locations where distinguished bryologists have studied and worked

By

Riclef Grolle

THIS PAPER is a modified version of a poster exhibited during the Fifth Meeting of CEBWG at Leipzig, 25-29 August 1986 (see *Bryol. Times*, 40: 7, 1986.). At the same time it provides some historical background for the meeting of bryologists from all over the world scheduled to take place during the XIV International Botanical Congress in Berlin (West) from 24 July to 1 August 1987.

On the map (Fig. 1) 3 categories of places are distinguished, according to their bryohistorical importance, by the size of the numbers, i.e. 1-3, 4-9, 10-25. The lists are presented in alphabetical order within each category, e.g. Berlin, Jena and Leipzig in the first as these were the main centres of bryological research in the past. Otherwise the arrangement is thought to be self-explanatory.

1 BERLIN

1756-1812 Willdenow: physician, professor of natural history (1798-1810) and of botany (1810-1812) in Berlin.

1764-1835 Floerke: 1799-1815 compiler of the 'Encyclopaedisches Dictionair' in Berlin, see under ROSTOCK and JENA.

1767-1851 Link: 1815-1852 professor of natural history in Berlin.

1769-1859 A. von Humboldt: born and died in Berlin, student in Frankfurt/O., Berlin and Göttingen, living mainly in Berlin, but for some time also in Jena (1797) and other places. Collected bryophytes in the Neotropics and the Urals.

1788-1850 Kunth: born in Leipzig, 1829-1850 professor of botany in Berlin. Published 'Synopsis plantarum etc.' (1822 - 1825).

1788-1856 v. Flotow: Rittmeister, 1812 in a military school in Berlin. Important collector of bryophytes, mainly in Silesia, associated with Nees von Esenbeck.

1788-1859 Ruthe: twice deserted from military service under the Westphalian King Jérôme, stu-

dent and later teacher in the grammar school in Berlin.

1805-1877 A. Braun: 1851-1877 professor of botany in Berlin.

1837-1921 Warnstorf: teacher, from 1899 onwards in Berlin; eminent sphagnologist.

1842-1927 Stephani: born in and schoolboy in Berlin, see under LEIPZIG.

1843-1916 Kny: student in Breslau, Munich and Berlin, 1863 Dr. phil. in Berlin, 1873-1916 professor in Berlin.

1851-1925 P. Sydow: bibliographer and schoolmaster in Berlin. Author of 'Die Lebermoose von Deutschland' (1882).

1853-1923 Osterwald: teacher at grammar school in Berlin.

1861-1930 Fleischer: eminent expert of mosses on a worldwide scale.

1864-1933 Correns: wrote 'Untersuchungen über die Vermehrung der Laubmoose durch Brutorgane und Stecklinge' (1899), later an eminent expert of genetics.

1865-1931 Loeske: critical taxonomist of European mosses.

1867-1954 Lorch: Grammar-school teacher who published 'Die Torf- und Lebermoose' (1914).

1876-1963 Quelle: born in Nordhausen, teacher from 1908 onwards in Berlin.

1879-1946 H. Sydow: civil servant, longstanding editor of *Hedwigia*.

1890-1979 K. Koppe: studied bryofloristics of Central Europe.

1893-1970 Reimers: longstanding editor of *Hedwigia*, 1922-1970 in Berlin. Custodian, then professor from 1947 onwards. Author of various monographs, e.g. *Microrpterygium*. [continued on p. 6.]

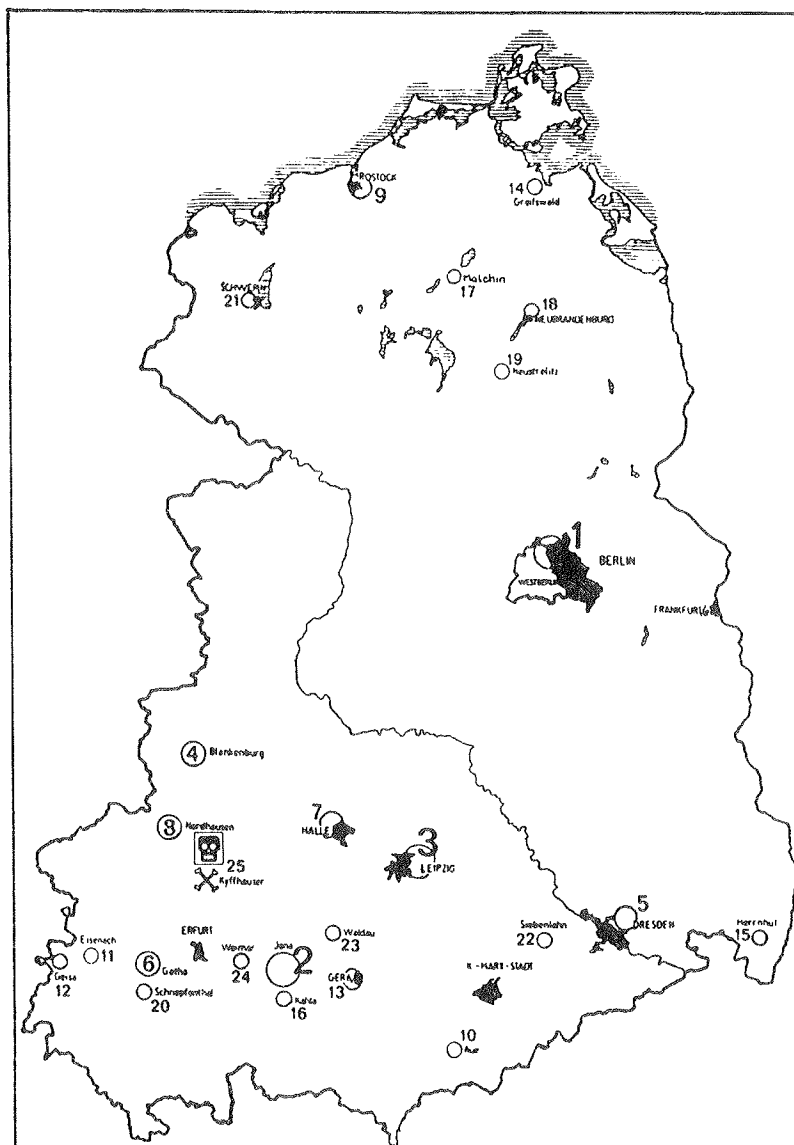


Figure 1. Bryological centres in the German Democratic Republic.

A bryohistorical landscape
[continued from page 5.]

1899-1975 C. Troll: 1930-1936 professor of geography in Berlin. Collected bryophytes in the tropical Andes and in Sikkim.

1907-1970 P.-C. Chen: student and Dr. rer. nat. (1939) in Berlin with thesis entitled 'Studien über die ostasiatischen Arten der Pottiaceen', later professor in Nanking and eminent founder of bryology in China.

1909- Meusel: and Dr. rer. nat. in Berlin with thesis entitled 'Wuchsformen und Wuchstypen der europäischen Laubmoose' (1935). Since 1947 professor of botany in Halle.

2 JENA

1542-1583 Thal: 1561 student of medicine in Jena, physician. Author of 'Sylva hercynica' (1588) which includes lower cryptogams.

1688-1719 Ruppius: author of 'Flora Jenensis' (1718) where the generic name *Jungermannia* is established.

1718-1792 Schmidel: student in Jena and Halle, physician, professor of pharmacy in Bayreuth and Erlangen. His thesis 'De Blasia (1759) and 'De Jungermanniae caractere' (1760) was the first ever published exclusively dealing with bryophytes.

1761-1802 Batsch: born and died in Jena, physician, 1786 Dr. phil. and Dr. med. in Jena, 1787 professor of medicine, from 1792 professor of philosophy and from 1794 also director of the Jena Botanical Garden. Author of 'Dispositio generum plantarum Europae synoptica' (1794) which includes lower cryptogams.

1764-1835 Floerke: 1797 student in Jena with Batsch, see under BERLIN and ROSTOCK.

1765-1850 F.G. Dietrich: born in Jena-Ziegenhain, see under EISENACH.

1771-1839 Funck: student in Jena with Batsch, pharmacist. Published the important exsiccata 'Cryptogamische Gewächse des Fichtelgebirg's' (1801-1838).

1775-1813 Wibel: 1796 student in Jena with Batsch, physician. Author of 'Primitiae florae Werthemensis' (1799), which includes lower cryptogams.

1776-1858 Nees von Esenbeck: 1796 Student in Jena with Batsch, physician, professor of botany in Erlangen (1817), Bonn (1818-1851) and Breslau (1831-1851), 1818-1851 president of the Leop.-Carol. Academy, 1848-1849 involved in the revolution, in 1851 dismissed from his posts without salary at the age of 75, living his last years in poverty.

1779-1864 Treviranus: 1798 student in Jena with Batsch, see

under ROSTOCK.

1792-1860 Lehmann: 1814 Dr. phil. in Jena, 1818-1860 professor of physics and natural history in Hamburg, from 1820 additionally director of the Hamburg Botanical Garden; his very important collection of exotic hepatics now in S.

1799-1837 Zenker: 1818 student in Jena, later Dr. phil. and Dr. med. in Jena from 1828 until his death there. Professor of the philosophical faculty at Jena. Published with Dietrich (see below) the exsiccata 'Musci Thuringici' (1821-1825).

1799-1838 J.D.N. Dietrich: born in Jena-Ziegenhain and died in Jena, 1828-1837 academical gardener in Jena. Published exsiccata of bryophytes together with Zenker (see above).

1804-1881 Schleiden: student and Dr. phil. (1839) in Jena, 1839-1863 professor of botany in Jena, 1863-1864 professor in Dorpat (Estonia), founder of cell theory and author of 'Grudzüge der wissenschaftlichen Botanik' (ed. 1, 1843).

1806-1881 Rabenhorst: 1841 Dr. phil. in Jena, see under DRESDEN.

1844-1912 Strasburger: born in Warsaw, student (1864) and Dr. phil. (1866) in Jena, 1868 university teacher in Warsaw, professor at the age of 25 in Jena (1869-1881), discovered meiosis, founder of the famous 'Lehrbuch der Botanik für Hochschulen' (ed. 1, 1894).

1848-1919 Stahl: student in Halle (and Strasburg), 1881-1919 professor of botany in Jena. Collected bryophytes in Java.

1880-1961 Herzog: professor of pharmacognosy (1925-1948) and later of special botany in Jena. His important collection of bryophytes in JE. Commemorated in *Herzogiella*, *Herzogobryum*, *Herzogilaria* and the journal *Herzogia*.

1883-1960 Renner: professor of botany in Jena (1920-1948), and Munich (1948-1960), outstanding expert in genetics. Collected bryophytes in Java.

1896-1981 F. Koppe: 1919 student in Jena, author of numerous papers on bryofloristics, especially of Central Europe.

1905- Stodiek: student and Dr. phil. (1936) in Jena with Herzog. Her thesis was entitled 'Soziologische und ökologische Untersuchungen an den xerophyten Moosen und Flechten des Muschelkalkes in der Umgebung von Jena'.

1907- Mägdefrau: born in and student at Jena, mainly palaeobotanist, 1942 professor in Strasburg, 1949 in Munich, 1960 in Tübingen.

1907- Hilpert: student (1927-1929, 1930-1932) and Dr. rer. nat. (1932) in Jena under Herzog, with a thesis entitled 'Studien zur Systematik der Trichostomaceen'.

1908- Carl: born in Eisenach, student and Dr. rer. nat. (1931) in Jena under Herzog, with a thesis entitled 'Die Arttypen und die systematische Gliederung der Gattung *Plagiochila* Dum.'

1908- Zwickel: student (1927-1929, 1930-1932) and Dr. rer. nat. (1932) in Jena with Herzog, pharmacist. His thesis was entitled 'Studien über die Ocellen der Lebermoose'.

1908- Degenkolbe: student in Halle (1931-1933) and Jena (1934-1936), Dr. rer. nat. (1937) in Jena with Herzog, pharmacist. His thesis was entitled 'Brutorgane bei beblätterten Lebermoosen'.

1910- K.H. Walther: student (1929-1933) and Dr. rer. nat. (1933) in Jena with Herzog. His thesis was entitled 'Untersuchungen über die Variabilität innerhalb des Formenkreises von *Polytrichum juniperinum* Willd.'

1910- G.R.W. Hoffmann: student (1931-1934) and Dr. rer. nat. (1934) in Jena with Herzog. His thesis was entitled 'Monographische Studien über die indomalayischen Arten von *Pycnolejeunea*'.

1911- Eifrig: student (1931-1936) and Dr. rer. nat. (1936) in Jena with Herzog. His thesis was entitled 'Monographische Studien über die indomalayischen Arten von *Taxilejeunea*'.

1914-1982 Giacomini: student in Jena during a period in World War II with Herzog, later professor of botany in Naples and Rome.

1914-1983 Benedix: student in Dresden (1934) and Jena, Dr. rer. nat. (1947) in Jena with Herzog, later mycologist in Dresden. His thesis entitled 'Indomalayische Cololejeuneen' was published in 1953.

3 LEIPZIG

1723-1803 Boehmer: professor in Wittenberg, editor of 'Definitiones generum' ed. 3 (1760), by C.G. Ludwig. He validly established the generic name *Sphaerocarpos* Boehmer.

1730-1799 Hedwig: born in Kronstadt (Siebenbürgen, Rumänien), student (1752) and Dr. med. (1759) in Leipzig, physician in Chemnitz (1762-1781) and Leipzig (1781-1786), 1786 professor of botany and director of the botanical garden in Leipzig. 'Theoria generationis' ed. 1 (1784) appeared at Petropoli (Petersburg). His 'Species Muscorum frondosorum' (1801) is the starting point for names of Musci, except *Sphagnum*. Commemorated

[continued on page 7.]

A bryohistorical landscape
[continued from p. 6]

in *Hedwigia* P. Beauv. nom. cons. and the journals *Hedwigia* and *Nova Hedwigia*. His herbarium is mainly in G.

1739-1810 Schreber: born in Weissensee (Thuringia), physician, 1764-1769 secretary of the 'Ökonomische Gesellschaft' in Leipzig, professor of medicine in the University of Bützow (Mecklenburg), 1769 professor of medicine in Erlangen. Author of '*Spicilegium Florae Lipsicae*' (1771).

1775-1853 Schwaegrichen: born and died in Leipzig, student and Dr. med. (1799), then professor of natural history (1802-1806) and of botany (1806-1852) in Leipzig. His herbarium is combined with Hedwig's and now in G.

1788-1850 Kunth: born in Leipzig, see under BERLIN.

1793-1851 G. Kunze: born and died in Leipzig, professor of botany in Leipzig, established *Cyathodium Kunze*.

1824-1877 Hofmeister: born and died in Leipzig, till 1863 a music merchant, from 1863, professor of botany in Heidelberg and since 1872 in Tübingen; proposed the antithetic alternation of generations in plants.

1842-1927 Stephani: born in Berlin, merchant, 1880-1927 living in Leipzig. Author of '*Species Hepaticarum*' (1898-1924), and numerous other papers on exotic hepatics.

1843-1907 O. Kuntze: born in Leipzig, owner of a factory. Author of '*Revisio generum plantarum*' (1891).

1845-1920 Pfeffer: professor of botany in Leipzig, outstanding exponent of plant physiology. Published the first thorough study on the oil-bodies of hepatics: '*Die Ölkörper der Lebermoose*' which appeared in *Flora* 57: 2-6, 17-27, 33-43, 1874.

1848-1887 Winter: born in Leipzig, 1876-1883 high-school teacher of botany in Zürich, 1883-1887, again living in Leipzig.

1855-1932 Goebel: 1881 'Erster Assistent' in Leipzig, see under ROSTOCK.

1862-1938 Moenkemeyer: 'Inspektor' of the Botanical Garden in Leipzig.

1878-1950 Hosseus: student in Freiburg i. Br., Kiel, Genève, Leipzig and Berlin, 1903 Dr. phil. in Leipzig; collected bryophytes in SE Asia (1904-1906), from 1913, lived and collected bryophytes in Argentina and from 1916 professor of botany at Cordoba (Argentina).

4 BLANKENBURG

1795-1880 Hampe: 1825-1876 apothecary in Blankenburg, who described many Central European and exotic bryophytes. His herbarium is now at BM.

5 DRESDEN

1793-1879 H.G. Reichenbach: 1817-1820 professor of medicine in Leipzig, 1820-1879 professor of natural history in Dresden.

1806-1881 Rabenhorst: apothecary, 1841 Dr. phil. in Jena, 1840-1875 living in Dresden, founder and editor for many years of *Hedwigia*, of the famous 'RABENHORST'S Kryptogamenflora von Deutschland etc.' and of various exsiccata.

1868-1940 Stolle: gardener at various places, later green grocer in Dresden. Published exsiccata of Hepaticae, together with Schade (see next entry).

1874-1966 Riehmer: teacher who studied the bryofloristics of Central Europe, especially Saxonia. Schade & Stolle (see last entry) published the exsiccata 'Hepaticae Saxonicae' (1927-1934).

1914-1983 Benedix: 1934 student in Dresden, later in Jena, from 1947 until his death a mycologist in Dresden. For his bryological work, see under JENA.

6 GOTHA

1761-1828 Bridel (Bridel-Brideleri): born and studied in Switzerland, a teacher of princes in Gotha, later held various posts at the court in Gotha until his death. His herbarium is in B (preserved).

7 HALLE/S

1757-1834 A.W. Roth: 1775 student in Halle, 1779-1834 physician in Bremen-Vegesack. His '*Tentamen Florae Germanicae*' (1788-1802) includes lower cryptogams.

1765-1837 C.F. Schultz: 1791 Dr. med. in Halle, see under NEUBRANDENBURG.

1766-1833 Sprengel: 1785-1787 student in Halle, 1787 Dr. med., 1787-1833 professor in Halle.

1809-1861 Junghuhn: born in Mansfeld, 1827-1829 student in Halle, physician. Collector of cryptogams in Java.

1818-1899 C. Müller Hal.: 1843-1899 living in Halle, editor of the popular journal *Natur*, described exotic taxa of mosses in very great numbers, the majority proving to be synonyms.

1848-1919 Stahl: student in Halle, see under JENA.

1883-1976 Burgeff: 1920 professor of botany in Halle, 1921 in

Munich and 1923 in Göttingen, from 1925 onwards at Würzburg. Collected bryophytes in the Philippines. Published '*Genetische Studien an Marchantia*' (1943).

1909- Meusel: 1947-1975 professor of botany in Halle, see under BERLIN.

8 NORDHAUSEN

1542-1583 Thal: born in Erfurt, 1561 student of medicine in Jena, physician in Stendal, Stolberg and from 1581 onwards in Nordhausen. Author of '*Sylva hercynica*' (1588), which includes lower cryptogams.

1792-1857 Wallroth: born near Stolberg, student in Halle and Göttingen, from 1822 a physician in Nordhausen.

1876-1963 Quelle: born in Nordhausen, teacher from 1908 onwards in Berlin.

9 ROSTOCK

1764-1835 Floerke: student in Bützow (Mecklenburg) for three years, 1797 student in Jena, 1799-1815 Compiler in Berlin, 1816-1835 professor in Rostock.

1779-1864 Treviranus: 1798 student in Jena, physician, 1812-1816 professor of natural history in Rostock, 1816-1830 professor of botany in Breslau, 1830-1864 in Bonn.

1855-1932 Goebel: 1881 'Erster Assistent' in Leipzig, 1882-1887 professor of botany in Rostock, later in Marburg and Munich.

10 AUE

1878-1928 Röll: mainly Sphagnologist. Author of '*Die Thüringer Torfmoose und Laubmoose*', (1915).

11 EISENACH

1765-1850 F.G. Dietrich: born in Ziegenhain near Jena, accompanied Goethe on a tour from Weimar to Karlsbad in 1785, 1792-1801 ducal gardener in Weimar, from 1807 ducal gardener in Eisenach and later appointed as professor of botany there. Author of '*Vollständiges Lexicon der Gärtnerei und Botanik*' (ed. 1, 1801-1811), which includes lower cryptogams.

1851-1923 Janzen: studied bryofloristics, later living in Freiburg i. Br., illustrated many hepatics in K. Müller's famous '*Die Lebermoose*' (1905-1916).

1893-1939 Migula: 1895-1929 professor of the 'Forstakademie' in Eisenach.

1908- Carl: born in Eisenach, see under JENA.

[continued on p. 8.]

A Bryohistorical Landscape [continued from page 7.]

12 GEISA

1842-1909 Geheeb: pharmacist for many years at Geisa, living his last years in Freiburg i.Br.

13 GERA

1841-1902 Naumann: (naval)physician, 1868-1871 on board the corvette 'Medusa', 1874-1876 on board the corvette 'Gazelle', 1877-1902 living in Gera.

14 GREIFSWALD

1793-1850 Hornschuch: apothecary at various places, 1820-1850 professor of natural history in Greifswald.

15 HERRNHUT

1788-1875 Breutel: Bishop of the 'Brüdergemeinde in Herrnhut' - important collector of bryophytes in the Lesser Antilles and South Africa.

16 KAHLA

1835-1881 Lorentz: born in Kahla, Dr. (1860) and high school teacher at Munich, 1870-1881 professor botany in Cordoba (Argentina). Collected bryophytes in Argentina and Uruguay.

17 MALCHIN

1734-1805 J.C. Timm: pharmacist and botanist, from 1760 pharmacist (later also burgomaster) in Malchin (Mecklenburg), associated with Hedwig. Author of 'Fl. Megapol. Prodr.' (1788).

18 NEUBRANDENBURG

1765-1837 C.F. Schultz: born in Stargard (Mecklenburg), 1791 Dr. med. in Halle, physician in Neubrandenburg until his death. Author of 'Recensio Generum *Sarbulae et Syntrichiae*' (1823).

19 NEUSTRELITZ

1778-1810 Blandow: born and died in Waren (Mecklenburg). Published the exsiccata 'Musci frondosi Exsiccati' (1804-1810).

20 SCHNEPFENTHAL

1821-1873 Röse: teacher in Schnepfenthal.

21 SCHWERIN

1821-1882 Brockmüller: county teacher, later inspector of butcher's meat in Schwerin till his death. Published the exsiccata 'Mecklenburgische Kryptogamen' (1862-1869).

22 SIEBENLEHN

1821-1891 Amalie Dietrich: born in Siebenlehn (Saxonia), 1863-1873 research traveller in Australia and the South Pacific, later curator of the botanical garden at Hamburg. Collected bryophytes in Australia.

23 WALDAU

1834-1913 Schliephacke: born in Halberstadt, pharmacist and owner of a factory in Waldau near Osterfeld, died in Dresden-Blasewitz. His large and important herbarium is in JE.

24 WEIMAR

1838-1903 Haussknecht: born in Bennungen near Merseburg, lived for a long time and died in Weimar, outstanding botanist. Collected bryophytes e.g. in Persia.

1862-1948 J. Bornmüller: From 1903 curator of the herbarium Haussknecht in Weimar, reputed phytotaxonomist who also collected bryophytes.

25 KYFFHÄUSER

About 4,000 years ago, people of the Bronze Age spread mats of *Rhytidiadelphus triquetrus* on the bottom of deep caves in the Kyffhäuser Mountains for their comfort during cannibalistic rites.

WITHOUT DEFINITE LOCATION

1679-1737 Micheli: born and died in Florence, outstanding pre-Linnean botanist who devoted his special interest to lower cryptogams. According to his biographer, Targioni-Tozzetti 1858 (Not. Vita Micheli), he was sent by the Grand Duke of Florence as a spy to Thuringia, through Austria and Silesia under the cloak of collecting plants to learn about the production of tin plate, escaping from threatened arrest only through rapid flight.

WB Phytotaxonomie, Friedrich-Schiller-Universität, Jena, DDR-6900, German Democratic Republic.

ELECTIONS I.A.B. COUNCIL
1987-93

Ballot Results

Number of ballot forms received 109

President:

Greene, 71 votes (elected)
Van Zanten, 37 votes

Vice President:

Crosby, 58 votes (elected)
Koponen, 63 votes (elected)
Ramsay, 44 votes
Váňa, 44 votes

Councillor:

Ando, 68 votes (elected)
Buck, 65 votes (elected)
Delgadillo, 68 votes (elected)
Frahm, 75 votes (elected)
Geissler, 62 votes (elected)
Miller, 67 votes (elected)
Schumacker, 40 votes
Wu, 53 votes

Based on the ballot results, the 1987-1993 Council is as follows:

President:

S.W. Greene (Great Britain)*

Past President:

H. Inoue (Japan)*

First Vice-President:

T. Koponen (Finland)*

Second Vice-President:

M.R. Crosby (U.S.A.)*

Secretary:

D.H. Vitt (Canada)*

Councillor:

H. Ando (Japan)*
W.R. Buck (U.S.A.)*
C. Delgadillo M. (Mexico)*
J.-P. Frahm (Germany)*
E.P. Geissler (Switzerland)*
Z. Itwatsuki (Japan)*
N.G. Miller (U.S.A.)*
G.S. Mogensen (Denmark)*
G.A.M. Scott (Australia)*
J. Szwejkowski (Poland)*

* until 1993, * until 1999.

Ann Arbor, 2nd March, 1987
S.R. Gradstein

[For composition of outgoing Council, see *Bryol. Times* 10: 10. Ed.]

NO AUGUST 1987 ISSUE PLANNED

THE NEXT ISSUE of *The Bryological Times* will not appear until October 1987! The reason there will be no August issue is that the Editor expects to be moving house during the coming summer, following his retirement from the University of Reading on 31 March, 1987. This move, combined with his attending the International Botanical Congress in Berlin, and the need to engage a new Secretary, has necessitated this announcement.

The Editor will give his new address in the October issue. In the meantime all correspondence should continue to be sent to him in the normal way at the Department of Botany, University of Reading, London Road, Berkshire RG1 5AQ, England (Telex: RULIB 847813).

Vive le *Bryological Times*!

Editor.

Spreadsheets: powerful statistical tools for biologists*

by M.G. Kelly

It is a truism that the business world ultimately holds sway over computer technology far more than the relatively small and specialised needs of the scientific community. This is reflected in the software market and it is, perhaps, a fruitful exercise for the latter to examine what the former has to offer. This article examines one such application - the spreadsheet, particularly because these are often part of the software "bundled" in with the initial purchase of modestly-priced items such as the Sinclair QL. They are relatively recent innovations, dating back to 1978 when VisiCalc first became available in the USA, but rapidly caught on, particularly in finance and budgeting.

The spreadsheet, a packet of programs, based round a matrix, to enable a businessman to make financial calculations quickly and efficiently, becomes, in the hands of a scientist, a powerful statistical tool, plugging a gap in complexity between the pocket calculator and the purpose-built statistical package. The former is ideal for simple statistics, standard deviations and linear regressions for example, whilst the latter could be used when large numbers of calculations are needed, or for complex mathematics, but is both expensive and requires large amounts of computer memory. The spreadsheet has one further advantage over a mainstream statistical package which may not be apparent at first: the spreadsheet is essentially an empty matrix within which the calculations are made and consequently there is no soft option of selecting a statistical test "because it's there" as is the great temptation with a large package. Obviously a package such as SPSS-X is essential when multivariate techniques are required but for many smaller, less complicated tests then the spreadsheet is an adaptable tool but never, so long as the individual has to set up the cells, the master. In addition there may be facilities within the spreadsheet for automatic calculation of such basic quantities as sums, means, standard deviations and logarithms.

To illustrate this I shall use an example from my own work. As part of a study on heavy

metal accumulation by the aquatic bryophyte Rhynchostegium riparioides I was interested to compare regression coefficients by an analysis of variance (ANOVA). I could find no subroutine in any of the statistical packages available to me which would do this and my attempts to perform the calculation manually were time-consuming and prone to mistakes. This was when I turned to the spreadsheet which was provided with a Research Machines (RM) Nimbus - Microsoft Multiplan. The easiest way to set up the cells was to follow an example in a statistics textbook. Each column of data was entered into the matrix and the calculation was performed in the cells below. Once the answer from the spreadsheet tallied with that in the book then it was a simple matter to enter my own data and read off the results from the bottom. The time per calculation, once the cells were set up, was a matter of minutes and using the "Save" and "Lock" facilities in the package the skeleton could be saved to repeat the procedure at later dates with no fear of erasing vital parts of the formulae.

A different type of use is simple modelling. I have used the spreadsheet to calculate Nernst potentials quickly over a range of concentrations of ions and from this estimated the potential for diffusion into plant cells. Again, once the spreadsheet had been set up, the calculation took a matter of minutes.

These two examples illustrate the potential value of spreadsheets in many statistical and biological applications. It is the DIY approach which makes it so versatile. Very little foreknowledge of computers is required and the application does not have to be 'shoe-horned' into the sub-routines available commercially.

Acknowledgements

I thank BP International Limited for financial support and D.J. Kelly for help in preparing this article.

Department of Botany, University of Durham, Durham DH1 3LE, England.

Column Editor's note: it is hoped to include more on spreadsheets in the continuing 'Purchasable Software' series, in a later column.

Computer Survey *

The computer questionnaire distributed with nr. 34 of the Bryological Times in June 1985 gave very little feedback. Discussions with colleagues provided several reasons for this: firstly, the announcement of the circular was made in a previous issue of the Bryological Times; secondly, the purpose of the questionnaire probably was not explained well enough; thirdly, many recipients of the questionnaire were put off by the technical details asked for; fourthly, some people just don't like filling in forms; fifthly, it was not made clear that the questionnaire was addressed to every computer user and not only to those with personal experience of programming.

We feel nevertheless that such an IAB computer user survey will allow us to get an overview of who is using computers, and of which kind they are, and which people are working with the same or compatible computers. This information can then be fed back to those who complete the questionnaires. In more detail, we should be able to determine:

- with whom an exchange of programs, text and data files is possible, e.g. for preparing manuscripts, building up lists of literature, herbarium records etc. The advantages of such computer communication are potentially enormous.
- who else has experience with the same computer model, the same system or certain software applications,
- with whom direct communication between computers is possible, via modems and data communication links.
- who can use or distribute software without copyright, as announced in the "Software Service" of the Bryological Times.

A similar survey has been made for the phanerogamists by Ch. Stirton (Kew Gardens) in a special insert to Herbarium

[continued on page 10.]

* This article, and the one on spreadsheets are contributions to the Computer Column edited by J.-P. Frahm and B.J. O'Shea. For addresses, see Bryological Times, 31:9.

Computer Survey (continued
from page 9.)

News 5(4/5), 1985. The results will also help to further the activities of bryologists in such ways as encouraging international access to the ABLIS bibliography (which has recently been made available online and will allow bryologists to download the quarterly bibliography and quickly incorporate individual listings in their own files.), and also to the bryological bulletin board (TAXACOM) recently set up by Richard Zander at Buffalo, NY.

Thus we are taking the liberty to enclose a second, altered questionnaire. Please return this questionnaire, even if not all the details are completed; at least let us have your name, address and model of computer. Colleagues who returned the first questionnaire need not complete this form again (unless they have more to add). The forms will be evaluated via a database program and every sender will get a list of those using the same (or compatible) system.

Jan-Peter Frahm, Universität
Duisburg, Fachbereich 6, Botanik,
Postfach 10 16 29, D-4100
Duisburg, Federal Republic
of Germany.

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

IAB Meetings in Berlin

IT IS ANNOUNCED that there will be a meeting of the IAB Council during the XIVth International Botanical Congress in Berlin, July 1987. There will also be a Business Meeting of the Association open to all members.

Any member wishing to bring a topic before either meeting should write to the undersigned by 30th June 1987.

S.R. Gradstein, Hon. Secretary,
International Association of
Bryologists, Institute of Sys-
tematic Botany, Heidelberglaan
2, 3584 CS Utrecht, The Netherlands.

Deaths

IT IS WITH SADNESS that Madame
Professeur Claudia Ștefureac
announces the death of Profes-
sor Dr. TRAIAN I. ȘTEFUREAC of
the University of București on
the 4th of October, 1986.

IAB BRYOLOGICAL TECHNIQUES WORKSHOP - MAINZ, GERMANY, 17 - 23 JULY, 1987

Tentative Programme

17 July: 15.00-20.00 Registration

18 July: 8.00- 9.00 Late Registration

1. 9.00-12.00 Development and Genetics

Basile: Procedure used for the axenic culture and experimental treatment of bryophytes
Rudolph: *Sphagnum* culture techniques
Simon: Axenic cultures of *Sphagnum*/demonstration
Cove: The isolation of biochemical and developmental mutants in *Physcomitrella patens*
Ashton: Genetic analysis in *Physcomitrella patens*
Geier: Moss protonema: Protoplasts and transport of auxins

14.00-15.45

Katoh: Effect on sugar on the callus formation and the re-generation of liverworts
Menon: Extracellular secretion of polysaccharides from moss cells
Nehira: Germination and protonemata
Ashton: Medium acidification by *Physcomitrella patens*

2. 16.15-16.40 Protein Techniques

Deising: Electrophoresis and immuno-detection of nitrate reductase from *Sphagnum*
Bhatla: Analysis of differentiation-specific-proteins by electrophoresis and isoelectric focusing, using hormone-sensitive mutants of *Funaria hygrometrica*
Krazakowa: Electrophoresis in taxonomy

17.30 Posters and practical demonstrations on sessions 1 & 2

19 July: 9.00 Departure for Excursion - Rhine Valley, Wispertal, Monastery Eberbach, moss sampling

20 July:

3. 9.00-12.35 Chemical Methods

Mues: Thin-layer chromatography (TLC) of flavonoid compounds from bryophytes
Asakawa: Separation and isolation of terpenes from liverworts and their analysis
Wilschke: HPLC analysis of phenolics
Raeymaekers: Chlorophyll extraction in mosses through dimethyl sulfoxide (DMSO)
Tuba: Method for the determination of the entire photosynthetic pigment composition of bryophytes
Beutelmann: Analysis of bryophyte lipids
Paffmann: Analysis of phospholipids and assay for lipases in mosses

4. 14.15-15.30 Ecology

Lewis-Smith: Recording bryophyte microclimate in remote and severe environments
Russell: Microclimate and growth measurements
Noakes: Growing mosses on a water gradient

14.00-17.30 Posters and practical demonstrations on sessions 1, 2 & 3.

15.30 Posters and practical demonstrations on session 4

17.30-19.00: Gottwald: demonstration of the moss collections of "Naturhistorisches Museum".

19.00-21.30: Visiting an old wine cellar: tasting wine and eating

21 July:

5. 9.00-10.35 Pollution

Empain: *A posteriori* detection of heavy metals pollution
Kirchhoff: Heavy metal analysis (Cd, Pb) in *Sphagnum*
Brown: Sequential elution technique for determining the cellular location of cations
Sarosiek: Air pollution - cation location

[continued on page 11.]

IAB Bryological Techniques Workshop - Mainz

[continued from page 10.]

6. 10.45-12.30 Different Methods

- Zawadski: Methods of bioelectricity
 Miller: Bryophytes in educational contexts
 van Zanten: Experimental phytogeography
 Slavick: Bryophyte herbarium methods

7. 14.15-16.20 Computer Applications

- Frahm: Computer applications for bryology
 Whittier: Microcomputer applications to large taxonomic and biogeographic data files
 Empain: A taxonomy-oriented computer language
 Michaelis: Digital image analysis of developing mosses
 Vitt: Numerical taxonomy

16.30-18.00 Posters and practical demonstrations on sessions 1-6

22nd July:

8. 9.00-10.30 Microscopical Methods

- Reiss: Freeze fraction and proton microprobes
 Berendsen: Preparation of moss samples for SEM
 Nordhorn-Richter: Physics of fluorescence techniques
 Hartmann: Fluorescence labelling of moss cells and moss protoplasts

9. 14.15-17.00 Paleoecology/Video/Photography

- Janssens: Paleoecology of bryophytes and the investigation of natural and anthropogenic acidification of peatlands
 Iwatsuki: Field macrophotography techniques
 Practical demonstrations sessions 1 - 8.

19.00 Dinner and Farewell Party

23 July:

- 9.00-13.00 Long-term experiments and other demonstrations
 9.00-13.00 Bryological sampling excursion to the Karlstal
 9.00-13.00 Visiting Gutenberg Museum and Cathedral - guided tour

Janice M. Glime, Department of Biological Sciences, Houghton, MI 49931, U.S.A.

[For further information about the Workshop, see *Bryol. Times*, 39:5. Editor.]



International PSE-Symposium

Chemistry and Chemical Taxonomy of Bryophytes



Saarbrücken
31.8.-2.9.1988

ADVANCE NOTICE

A symposium on chemistry and chemical taxonomy of bryophytes will be held at the Universität des Saarlandes, Saarbrücken (Federal Republic of Germany) from August 31 to September 2, 1988. By this meeting a comprehensive review of research on bryophyte chemistry including most recent developments will be made. The programme provides sections on structural chemistry, biochemical aspects, biological and pharmaceutical active compounds, accumulation of xenobiotics in context with air pollution, chemical capacity of bryophyte tissue cultures and chemo-taxonomical aspects. Lectures are given by many authorities working in these fields. There will also be the possibility of poster presentation and a limited number of additional lectures. The definite programme with all details will be issued latest at the beginning of 1988. Further enquiries will be given by the organizers.

Prof. Dr. H.D. Zinsmeister

Priv. Doz. Dr. R. Mues

Fachrichtung Botanik, Universität des Saarlandes, D-6600 Saarbrücken, B.R.D.

BRYOLOGISCHE EN LICHENOLOGISCHE

WERKGROEP KNNV (DBLWG)

THE TENTH ANNUAL combined meeting of the Dutch Bryological and Lichenological Working Group, and the professional bryologists organized through BION, took place on 7 March 1987.

The first speaker, Dries Touw, gave an account of the state of the new Flora to be published soon, and looked back on the years of work that had gone into it.

Next, Hans Cornelissen (speaking also for Gea Karssemeijer) reported on their studies on the succession on decaying fir-trunks in the highest parts of the Belgian Ardennes. Both the degree of decay and the surrounding environment turned out to be factors of importance.

Heinjo During gave an account of moss-patch dynamics in various plots near Barcelona. Surprisingly large shifts apparently occur in 1.5 months.

Dirk Blok reported on a recently-started inventory of a number of polders in the north east of The Netherlands, near the Dolder Estuary, all reclaimed after 1800 A.D. The fascinatingly-empty area (especially now that all elms are being cut for reasons of hygiene) supported some 100 species of mosses and liverworts.

Han van Dobben gave by far the most technical lecture on the effects of NH₃ on epiphytic lichens in an area with much intensive cattle farming. Through counteracting the acidifying effects of SO₂ the increasing NH₃-emission (the actual mechanisms seem to be more complicated than this) gave rise to an increase in the number of epiphytic species compared to the barren years of the sixties - early seventies.

Finally, we were regaled with a slide show by Ben van Zanten, about his recent travels through Tanzania.

P.H. Hovenkamp, Secretary, Bryologische en Lichenologische Werkgroep KNNV, Eiberoord 3, 2317 XL Leiden, The Netherlands.

Personalia

JAAKKO HYVÖNEN has a new address.

It is:-

Knopps,
02400 Kirkkonummi,
Finland.

Recent Publications

Bryologist, 89(3): 189-252, 1986.

Bull. B.B.S., 49: 1-40, 1987.

Bull. Bryol., XXIII In *Taxon*, 36(1): 288-293, 1987.

Crypt. Bryol. Lichen., 7(4): 433-532, 1986; 8(1): 1-93, 1987.

J. Hattori Bot. Lab., 61: 1-541, 1986.

Muscillanea, 6: 1-46, 1987.

Taxon, 36(1): 1-338, 1987.

Florschütz-de Waard, J. 1986. *Musci* (Part II). In Stoffers, A.L. & J.C. Linderman (eds.). *Flora of Suriname*, Vol. VI, Part 1: vii-x, 273-361, 225 x 158 mm, soft covers. E.J. Brill, Leiden for the Foundation van Eedenfonds. Available from the author, the Institute of Systematic Botany, Heidelberglaan 2, P. O. Box 80.102, 3508 TC Utrecht, The Netherlands, Price 25 D.fl. inclusive of postage.

This is a continuation of the flora, started many years ago, by the author's late husband. It consists of a treatment of 3 families, the Neckeraceae by the author and P.A. Florschütz, the Hookeriaceae by the author alone, and the Plagiotheciaceae by R. Zielman and the author. A third part to include the accounts of the Thuidiaceae, the Sematophyllaceae and the Hypnaceae, a general index and a key to genera, will complete the work.

The presentation follows the layout of the earlier part (*Flora of Suriname* Vol. VI, Part I (*Musci*, Part I) with the descriptions being supported by line drawings, details of the type specimens, synonymy, distribution throughout the Americas, habitat details, lists of specimens examined and comparative notes. Within each family keys to genera and species complete the taxonomic treatment. Some new combinations are made in *Schizomitrium*.

Gangulee, H.C. 1986. *Handbook of Indian mosses*, pages unnumbered, 50 colour plates and 4 text figures giving in total 127 pp., 220 x 140mm., hard covers, ISBN 90-6191-449-3. Indian edition, Series 11., A.A. Balkema, Postbus 1675, NL-3000 BR, Rotterdam, The Netherlands. Price £17.55 or D.fl.65. The same text was published a year earlier, i.e. in 1985 as ISBN 31-205-0026-1 with no reference to the Indian edition. Series, by Amerind Publishing Co. Pvt. Ltd., N-56 Connaught Circus, New Delhi 110001. Both

texts were printed in India.

In spite of the hopes raised by its title the purpose of this little book is, according to its preface, "to serve as a simple text book and a guide book for the advanced botany practical classes." What is offered are comments on the moss life cycle, an outline classification of the orders of Indian mosses, notes on collecting and preserving, a key to the genera treated and descriptions, supported by colour illustrations of 100 species, each from a different genus and a summary of each taxon's worldwide distribution. Thus not even a representative of each genus known to occur in India is included, there is no indication of the likely number of taxa in each, there are no synonyms and no notes about variation, comparisons with neighbouring taxa, etc. The colour plates are the best part of the book, but the colours are crude and the detail more hinted at than clearly revealed.

Introductory handbooks have a very important part to play in encouraging beginners to delve more deeply into a subject. With a little more thought, a better selection of representative taxa and a better text, e.g. one with an account of the biology of mosses, a list of further reading - even an index! - the author could have produced a more inspiring book that was more useful and easier to consult.

JOVET-AST, S. 1986. *Les Riccia de la region mediterrannee. Cryptogamie, Bryologie Lichenologie*, 7(3, Suppl.): 287-431, issued 15 July 1986. Available as a separate from the Laboratoire de Cryptogamie, Muséum National d'Histoire Naturelle, 12 rue de Buffon, 75005 Paris, price Fr.F. 180 (postage included).

The author, after outlining the geographical limits and the range of climates of the mediterranean region, considers the place of *Riccia* in the classification of the hepatics. There then follows an account of the phases of the *Riccia* life cycle, the morphology and anatomy of the plants, their caryotypic and chemical characteristics, and a summary of their biology, ecology and distribution throughout the Mediterranean.

Keys to the 31 species known from the region are based on thallus and spore characteristics. For each taxon detailed descriptions of the morphology, distribution and ecology are presented as well as the collecting details and location of the type specimen, synonymy, the number of chromosomes and notes covering a variety of topics. 65 plates illustrate the morphology and anatomy of the thallus, ornamentation of the

spore exine and details of the spores as revealed by the SEM. The work concludes with a detailed index to taxa and a comprehensive table of contents. Although written in French, French and English summaries are given. The whole work is produced to the commendably high standards associated with *Cryptogamie, Bryologie Lichenologie*.

Long, D.G. 1985. *Polytrichaceae*. In Mogensen G.S. (ed.). *Illustrated moss flora of Arctic North America and Greenland*. Meddelelser om Grønland, Bioscience 17: 1-57. 265 x 190 mm, soft covers.

Crum, H.A. 1986. *Sphagnaceae*. In Mogensen, G.S. (ed.). *Illustrated moss flora of Arctic North America and Greenland*. Meddelelser om Grønland, Bioscience, 18: 1-61, 265 x 190 mm, soft covers.

Available from Arnold Busck - International Booksellers, 49, Købmagergade, DK-1150, Copenhagen K, Denmark. Export price: No. 17, Dkr. 91 + vat + postage; No. 18, Dkr. 98 + vat + postage.

These two fascicules are the first parts to appear of IMFANAG = *Illustrated Moss Flora of Arctic North America and Greenland*. The forerunner of the present project started many years ago as the cherished brainchild of William C. Steere of New York who was joined in the mid 60's by the late Kjeld Holmen of Copenhagen. Since 1982 the project has been in the hands of Gert Mogensen of Copenhagen.

The area covered by the flora is immense, much of it still awaiting bryofloristic survey. All land north of the tree line in Alaska and Canada is included as is the whole of Greenland; Iceland is not included. The moss flora of this area is estimated to comprise approximately 500 species. Treatments of genera, families and orders will be published largely in the sequence in which they are ready rather than in taxonomic order. Once the work is complete it is planned to republish all the families in taxonomic order in 5 volumes! Each taxon is to be illustrated by a detailed drawing to show its habit and microscopic details. The majority will also be accompanied by a map showing known distribution throughout the region.

46 species are described in the two fascicules under review, 17 in 6 genera in the *Polytrichaceae* and 29 in *Sphagnum*. Keys to genera and species are provided. The descriptions are concise, synonyms are clearly cited with details of types, habit and distribution data are well summarized; helpful, critical

[continued on p. 13.]

Recent Publications
[continued from p.12.]

notes on variation are appended as necessary. The illustrations are of a high standard and the distribution maps are large with the known localities clearly shown. A list of selected specimens is included in each species treatment.

All involved are to be congratulated on a pleasing production.

Frahm, J.-P. 1985. *Afrikanische Campylopus* - Arten (Dicranaceae, Musci). *Bryophyt. Bibliotheca*, 31: 3-216, with 97 figs. [Issued December, 1985, fide author in litt.] Available through Antiquarian and New Booksellers - Price DM 60; £17; US \$24.

The treatment in German covers all the 256 species of *Campylopus* that have been described or reported from the continent of Africa, its offshore and neighbouring isles in the Atlantic, South Atlantic, and Indian oceans, including Madagascar, Mauritius and Réunion. After excluding 12 species from the genus, 49 are recognised together with one other species described as new by the author.

The descriptions are concise, being prefaced by sometimes lengthy lists of synonyms with details of the types. Habitat and distribution data are provided as are critical notes on variation etc. The lists of specimens examined are arranged by country or island group. The illustrations of each taxon include a habit drawing as well as microscopical details. A map showing the area of distribution in Africa, sometimes expanded to cover the whole world, is included. A key to the 50 species is provided.

The work ends with some annotated lists of taxa that for one reason or another have been excluded, an extensive bibliography and an index to species, including synonyms.

[Crosby, M. ed.]. 1985. Contributions to Systematic bryology. Dedicated to Lewis E. Anderson. *Monogr. Syst. Bot. Missouri Bot. Gard.*, 11: 1-216. Price US \$17.68, (incl. shipping and handling). Available from Dept. Eleven, Missouri Botanical Garden, P.O. Box 299, St. Louis, MO 63166-0299, U.S.A.

No matter how poorly developed a person's sense of humour may be, reading the first article in this publication is liable to render the reader helpless with laughter. For it is an effective

and highly humorous pen picture (it also includes a lot of photographs) of one of the great "characters" of American bryology, Lewis E. Anderson: it is written by another of them - Howard Crum. It has to be read to be appreciated - neither it nor Anderson can be summarized in a few words!

In spite of the levity of the opening article, the publication as a whole is not intended to be humorous. The 22 authors of the remaining 17 contributions range over a variety of bryological topics. Some are written by former graduate students, while others are colleagues who have collaborated with Anderson on aspects of muscology which interest him. Thus articles will be found on phylogeny, phytogeography, reproductive biology, cytology, morphology and taxonomy, both "classical" and "experimental".

The "tone" of the whole publication reflects the interests of an intellectually restless, inquisitive, eclectic who continues to contribute to the well being and development of North American muscology. Long may it be so.

Inoue, H. 1986. *Field guide for bryophytes*. Tokyo, Japan, Tokai University Press, 194 pp. with about 375 colour photographs and 150 line drawings; brief Japanese text. Price Yen 2,000, but available from the author at a discount of 20%. Orders to: Dr. Hiroshi Inoue, Department of Botany, National Science Museum, Hyakunin-cho, Shinjuku, Tokyo 160, Japan.

A delightful pocket-guide to two hundred common species of mosses and liverworts from Japan. Each page illustrates one species by means of two or three colour photographs of usually excellent quality. In addition, there are a few small line drawings of diagnostic characters and a brief explanatory text in Japanese.

The species are grouped in four broad habitat categories: the subtropical evergreen forest, the temperate deciduous forest, the boreal forest and the urban environment (gardens, rock walls and ruderal places).

In all, this is a very nice and handy picture book for those interested in the Japanese bryophyte flora. The price is a bargain.

S.R. Gradstein
Department of Biology
University of Michigan
Ann Arbor, Michigan 48109-1048, U.S.A.

T. I. Ștefureac 1908-1986

PROFESSOR DR. TRAIAN ION ȘTEFUREAC, a great personality of Romanian and European bryology, died on 4th October, 1986.

His PhD thesis, presented in 1940, was entitled: "Synecological and sociological investigations from Old Forest Slatioara (Bucovina)." It represented a pioneering work for Romanian and world bryology that is still in use and appreciated to-day. In his scientific work, bryological studies occupied a particular place, some such as "*Bryological studies in some vegetal formations from Romania*" and "*Bryophyte Conspectus from Dobrogea, Moldova, Bucovina*," etc., representing papers of major interest for Romanian bryology.

Recognizing his merits, he was sponsored as a member of the International Association of Bryologists (Utrecht) and of the Bryophyte Mapping Association for Europe (Liège). The initiative of editing the exsiccata "Bryotheca romanica" also represented a work of national and international interest.

Dr. G.H. Mohan, Grădina Botanică Sos. Cotroceni Nr. 32, București-Romania.

[An appreciation of Prof. Ștefureac, on the occasion of his 60th birthday, with a list of his bryological publications thus far, will be found in *Rev. bryol. lichénol.* N.S., 36(1-2):300-303, 1968.

Editor.

DIARY

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

1987

June 13-14. SBLs. Annual Assembly. Bernese Oberland. Further information from: Dr. K.A. Ammann, Syst.-Geobot Institut, Altenbergrain 21, CH-3013, Bern, Switzerland.

Mid-July. NBS. Annual business meeting and excursion. Isle of Fyn. Further information from G.S. Mogensen, Botanical Museum, Gothersgade 130, DK-1123, Copenhagen K., Denmark.

July 17-23. IAB. Mainz. Bryological Methods Workshop. For further information see this issue, p. 10-11.

[contd. over]

DIARY (contd.)

July 24-1 Aug. XIVth IBC Berlin (West). Preceded by IAPT Nomenclature Session, July 20-24. Latest announcement in *Bryol. Times*, 41:9. Address: XIV IBC. Bot. Garden and Museum, Königin-Luise-Strasse 6-8, D-1000, Berlin (West) 33, Germany.

Aug. 3-7. BLAM. Field excursion to the Allgäu, Southern Bavaria. For further information, see *Bryol. Times*, 41:9.

Aug. 5-19. BBS. Summer field meeting, Achill Island, Co. Mayo (1st week) and Westport (2nd week). Local Sec.: Dr. D. M. Synnott, National Botanic Gardens, Glasnevin, Dublin 9, Ireland. For preliminary information see *Bull. BBS*, 47:14.

Aug. 7-8. ABLs. Foray in Ohio. Leader J.A. Snider, Dept. of Biological Sciences, University of Cincinnati, Ohio, 45221, U.S.A.

Aug. 9-13. ABLs. Annual Meeting in conjunction with AIBS Meeting, Ohio State University, Columbus, Ohio, U.S.A.

Aug. (2nd half) SBLS. Inventory of cryptogams in the Alluvial deposits of the Gauli Glacier. Further information from Dr. K.A. Ammann, Syst.-Geo-bot. Institut, Altenbergrain 21, CH-3013, Bern, Switzerland.

Aug. 21-23. BSJ. 16th Annual Meeting at Zao, Yamagata-ken, with paper-reading sessions and field study on Mt. Jizogadake, Zao mountains. Further information from Mr. S. Ono, Yonezawa Higashi High School, Marunouchi 2-chome, Yonezawa-shi, Yamagataken 992, Japan.

Aug. 26-30. SBLS. Annual field Trip in Samnaur, Grison. Further information from Dr. K.A. Ammann, Syst.-Geobot. Institut, Altenbergrain 21, CH-3013, Bern, Switzerland.

September. The 12th Annual Andrews Foray will be held in

Maine, U.S.A. Write to: Dr. Nancy Slack, Biology Dept., Russell Sage College, Troy, NY 12180: or Dr. Robert Thomas, Dept. of Biology, Bates College, Lewiston, ME 04240, for further information and to be added to the mailing list.

Sept. 6. VWGB. Field trip to Braakman/Terneuzen (Netherlands). Meet at recreation area 10.00 hrs.

Sept. 26-27. BBS. A.G.M. and paper-reading meeting, Wye College, Kent. Local Sec.: Dr. M.A.S. Burton, MARC, The Octagon Building, 459A Fulham Road, London SW10 0QX. For preliminary notice, see *Bull. BBS*, 49:23.

Oct. 2-4. 3rd Annual Blomquist Bryological Foray, North Carolina, U.S.A. Based on Fontana Village, close to the Fontana Dam. Application forms and further information from the organizers: Brent Mishler, Department of Botany, Duke University, Durham NC 27706: or Marie Hicks, Department of Biology, Appalachian State University, Boone NC 28608, U.S.A.

Oct. 3. VWGB. Field trip to De Maten/Genk (Prov. of Limburg). Meet at entry reserve 09.30 hrs.

Nov. 8. VWGB. Field trip to Herselt/Westerlo (Prov. of Antwerpen). Meet at Herselt Church at 09.30 hrs.

Nov. BBS. Taxonomic Workshop. University of Manchester. Local Sec.: Dr. S.R. Edwards, The Herbarium, Manchester Museum, The University, Manchester M13 9PL. For preliminary details see *Bull. BBS*, 49:28.

November. John Child Memorial Foray to northern part of South Island, New Zealand. Further details from: Ms Gail Franho, Cawthorn Institute, P.C. Box 175, Nelson, New Zealand.

1988

April 6-13. BBS. Spring field Meeting, Cirencester. Local

Sec.: Miss K.A. Hearn, The National Trust, Spitalgate Lane, Cirencester, Gloucestershire GL7 2DE, U.K.

July 19-23. Joint BBS - British Ecological Society Meeting, Edinburgh. International Symposium on bryophyte ecology. For preliminary information, see *Bryol. Times*, 40:9. Local Sec.: Dr. P.J. Lightowlers, Institute of Terrestrial Ecology, Bush Estate, Penicuik, Midlothian, Scotland EH 26 0QB.

July 24-30. 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. 7-11. ABLs Annual Meeting in conjunction with AIBS meeting, University of California, Davis, U.S.A.

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 this issue p.11.)

Sept. 12. 6th CEBWG Meeting, Liblice (Village near Mělník), Czechoslovakia. For preliminary announcement of this 4-5 day meeting, see *Bryol. Times*, 40:10.

Sept. 17-18. BBS. A.G.M. and paper reading meeting, Liverpool. Local Sec.: Dr. J. Edmondson, County Museums Dept. William Brown St., Liverpool L3 8EN, U.K.

1989

Aug. 6-10. ABLs Annual Meeting in conjunction with AIBS Meeting, Univ. of Toronto, Canada.

1990

Aug. 12-18. Helsinki, Symposium on SE Asian bryophytes. See preliminary announcement in *Bryol. Times*, 41:4.

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 authors.

For details regarding membership of the International Association of bryologists (currently U.S. \$8.00 p.a.), write to the Honorary Secretary, Dr. S.R. Gradstein, Institute of Systematic Botany, Heidelberglaan 2, 3584 CS Utrecht, The Netherlands.

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ITEMS FOR THE NEXT ISSUE to be with the Editor, Dr. S.W. Greene, Department of Botany, The University of Reading, London Road, Reading RG1 5AQ, Berkshire, England (Telex 847813 RULIB) by the 1st of July, at the latest. Items for the regular columns should be sent direct to the column editors, whose names and addresses will be found in *Bryol. Times*, 31:9, 1985.