

The BRYOLOGICAL TIMES

Newsletter of the International Association of Bryologists

ISSN 0253-4738

March, 1984

No. 25

Personal Glimpses of V. F. BROTHERUS

MR. HEIKKI BROTHERUS, a newspaper man and legation councillor, has published memoirs of his childhood. The book - *Brotherus, H. 1982 : Seurapiiri. Ihmisiä, tapoja, miljöitä.* - 246 pp. Weilin & Göös, Espoo. ISBN 951-35-2816-2 (in Finnish) - includes two paragraphs about the bryologist V.F. Brotherus, his great uncle.

"The old man sat at his desk in a small room in which there were books, herbaria and covers for keeping documents up to the ceiling. In front of him he always had a magnifying glass. He studied and classified bryophytes. His special field was the mosses. He had classified them, writing thick works. From all over the world he received parcels, which he studied to classify the specimens and to name the species. The work seemed infinite. I was quite too small to understand that I sat in the home of a great scientist. I was interested in the stamps. He cut them off wrappers of the parcels. For instance, I got bunches of Philippine stamps, which I thought to be more valuable than the other ones. From him I also got a complete series of Bavarian stamps, which were a still greater rarity than the former, since Bavaria soon ceased printing stamps. I did not need to use money to increase the collections. The stamps donated by Uncle Victor were first-rate exchange material."

"Viktor Ferdinand was the only one of my great uncles whom I knew. To my mind he was really brilliant. The other people thought similarly, but I had a secret additional reason. I caught him on the sports ground watching a football game. I met him there often. He went there regularly and knew the players

by name. But he knew still better the names of all plants, including mosses. He was the greatest scientist in the family, if judged by his international reputation. I do not mind listing his publications or his honorary ranks, for he had been invited as an honorary member of numerous botanical and other scientific societies, and the honorary degree of Doctor was conferred on him by many universities. He was granted the honorary title of Professor, but the University of Helsinki could afford no office for him. Instead, he held a junior teacher's post for decades until his retirement; he taught, among other things, mathematics and natural sciences in the Swedish girls' school in Helsinki. At his funeral foreign guests arrived, he was praised in the addresses, and letters of condolence from distant countries were read. The staff of teachers of his school was astonished. They were unaware that he was also something other than their dear old junior teacher."

I am grateful to Mr. H. Brotherus for permission to publish this translation of the paragraphs relating to V. H. Brotherus.

Timo Koponen, Botanical Museum, University of Helsinki, Finland.

NEWS FROM HELSINKI

LI, ZHI-HUA (Guangzhou) will stay until 30.4.1984, working on a scholarship from the Academy of Finland.

LI, XING-JIANG (Kunming) will stay until 15.8.1984, financed through an exchange programme between Academia Sinica and the Academy of Finland.

Timo Koponen, Botanical Museum, University of Helsinki, Finland.

Availability of Unpublished Bryological Theses

IN NORTH AMERICA, and undoubtedly elsewhere, it is frustrating to realize that important research has been done but the results have never been published. For most North American university theses the information is relatively accessible. Schofield and Miller (1982) published a bibliography of all M.Sc. and Ph.D. theses on bryology that had been submitted to Canadian and United States universities. This bibliography is based on information solicited from all major academic institutions and on a careful search of titles published in the journals: *Dissertation Abstracts International*, *Doctoral Dissertations*, and *Microfilm Abstracts*. This bibliography, as complete as we were able to make it up to 1977, undoubtedly has omitted a number of titles, but it does present a fair summary of the richness of an unpublished literature on bryophytes.

For Ph.D. theses from major universities in the United States, access is reasonably easy. Xerox copies of most can be purchased in either paper-bound or buckram-bound copies. These are reduced to half the size of the original typescript. Photographs tend to be very unsatisfactory, but line drawings are usually very clear. The copies can be ordered, by author, title and year, from University Microfilms International, Ann Arbor, Michigan 48106, U.S.A. The price varies from approximately \$20.00 (U.S.) for soft-bound copies, and somewhat higher for buckram binding.

Both doctoral and master's theses from nearly all major Canadian universities are available from "National Library of Canada, Canadian theses on microfiche service, 395 Wellington

UNPUBLISHED BRYOLOGICAL THESIS
(contd. from p.1)

St., Ottawa, K1A 0N4, Canada." Microfiche costs approximately \$10.00(Canadian) per title, or on roll microfilm at a price of approximately \$18.00(Canadian). Although awkward to read, these are accessible. They are available in Canada only after a lapse of two years from the time the thesis was written.

The journal *Taxon* published two notes concerning xerox as a form of publication. Morton (1960) indicated that he considered theses available from University Microfilms International to be publications. With taxonomic works this raised a complex number of problems involving nomenclature which were discussed by Thomas (1960), who stated that xerox could not be considered as valid publication, noting that Article 29 of the International Code of Botanical Nomenclature states this quite clearly. This is a great relief to all systematists, since the date of "publication" would be exceedingly difficult to determine.

It is regrettable that a high proportion of graduate theses have not been published, but the research that they report remains important, and this information is available, albeit in a rather less-than-satisfactory form.

Morton, C.V. 1960. Effective publication by xerox? *Taxon* 9: 192.

Schöfield, W.B. & N.G. Miller, 1982. The status of floristic bryology in North America. *Beih. Nova Hedwigia* 71: 399-429.

Thomas, J.H. 1960. Xerox certainly does not constitute effective publication. *Taxon* 9: 258-259.

Department of Botany, University of British Columbia, 2075 Wesbrook Mall, Vancouver, B.C. Canada V6T 1W5.

Desiderata

WANTED : *Dicranella rufescens*

I AM CURRENTLY working on the rhizoidal gemmae of *Dicranella rufescens*. I would be grateful to receive specimens from any part of its range.

S. Risse, Minkdelle 3, 4300 Essen 1, West Germany.

PRODUCTION OF THE
BRYOLOGICAL TIMES

THE PRODUCTION AND DISTRIBUTION of the *Bryological Times* has now become a combined effort involving many different institutions throughout the world. Another good result of the Tokyo Conference was the spread of interest in the *Newsletter* to delegates from so many countries. Offers of help with responsibility for distribution have been accepted from Dr. P. C. Wu from Beijing (China), Dr. R. D. Seppelt from Kingston (Tasmania) and Dr. T. Pócs from Vácrtót (Hungary).

It may be of interest to readers to know how production and distribution is at present carried out. A master copy for each issue is produced in Reading and is sent to Utrecht for printing and publishing at the Instituut voor Systematische Plantkunde (M.A. van Slageren). Further copies are made in St. Louis, Missouri, U.S.A. at the Missouri Botanical Garden (Dr. M.R. Crosby) and in Tokyo at the National Science Museum (Dr. H. Inoue). The various distribution centres are: St. Louis for the U.S.A., Canada and Central America; Tokyo for Japan and S. E. Asia; Beijing for China; Kingston for Australia, Tasmania and New Zealand; Vácrtót for Eastern Europe, Cuba and Vietnam, and Utrecht for the rest of the world. Only a very limited distribution now takes place from Reading.

The Editor and Production Manager would like to acknowledge the financial assistance given to IAB towards production and distribution of the *Bryological Times* by the International Union of Biological Sciences, Paris; Tokushima Bunri University, Japan and the International Association of Plant Taxonomists, Utrecht. We would also like to extend our grateful thanks to all bryologists and Institutions for their services. Without their help the *Bryological Times* could not have become so well established as an international newsletter in the five short years of its existence since No. 1 was issued in January, 1980.

M. van Slageren Dr. S.W. Greene
Production Mgr. Editor
Utrecht. Reading.

Revised Submission Dates

READERS ARE ASKED TO NOTE that from 1984 onwards material, to have any chance of appearing in the next issue, needs to arrive in Reading by the 1st day (not the 15th) of the preceding month, i.e. 1st Feb, 1st April, 1st June, 1st Aug, 1st Oct and 1st Dec.

UTILITY OF BIBLIOGRAPHIES

THE FIRST AIM OF A BIBLIOGRAPHY should be completeness. This raises the question, which bibliography would be the most complete for bryologists? To get an idea of the practical value of different bibliographies, four have been tentatively tested, viz. the bibliographies in:

The Bryologist
Journal of Bryology
Cryptogamia - Bryologie, Lichenologie and
Biological Abstracts

as the bibliographies probably most used, except for those in bryological journals. The purpose was to try and reach a decision as to which bibliography should be used to build up a current subject file.

For this test, 50 non-physiological and non-ecological bryological titles published in 1982 were selected at random from literature citations in journals. These titles were searched for in the four bibliographies, and the percentage of "hits" calculated. Of course, another choice of titles, perhaps for certain other special subjects, especially at the low rate, would give different percentages, but in my opinion the general trend of the results would have been the same. The results were as follows:-

<i>Bryologist</i>	92%
<i>Journal of Bryology</i>	80%
<i>Cryptogamia</i>	64%
<i>Biological Abstracts</i>	48%

It must be noted that there are naturally some other ways in which a bibliography can be evaluated. The bibliographies with the fewest "hits", for instance, have more or less detailed summaries for each title. Furthermore, it must be noted that for testing *Biological Abstracts* the computer service of the Senckenberg Institute in Frankfurt, named BIOSIS, was used, which gives printouts of all titles with bryophytes indicated as key words. That covers, for example, zoological papers in which bryophytes are also mentioned. Therefore a comprehensive list of bryological titles published per year has not been selected for comparison, the results being for some selected titles found in the four bibliographies.

Jan - Peter Frahm, Universität
Duisburg, Fachbereich 6, Botanik
Postfach 101629, D-4100 Duisburg,
Federal Republic of Germany.

News from Societies

THE DIAMOND JUBILEE MEETING OF THE BRITISH BRYOLOGICAL SOCIETY

THIS SPECIAL AUTUMN MEETING was held in London, at Bedford College, from Sept. 16-18, 1983, to celebrate the sixty years of the Society's existence and to review the achievements and future developments of bryology. After a Council meeting on the Friday evening, the full meeting opened on Saturday, September 17th, with the presentation of papers to one of the largest audiences ever assembled for an autumn meeting of the Society.

Professor P. W. Richards gave the introductory paper on "The Moss Exchange Club and the British Bryological Society 1896 - 1983" in which he explained the origins of the Society and its later development. This was followed by a most interesting survey by Drs. Helène Bischler and S.R. Gradstein of the spread of bryology, and the development of societies specializing in bryophytes, throughout the world. We gathered from this paper that apart from Western Europe, Japan

and N. America, bryologists are very thinly scattered through the rest of the world.

Dr. E.V. Watson then presented the results of a year's research into the "Recording activities of the British Bryological Society from 1923-1983 and their impact on advancing knowledge". This paper included some very interesting and original analyses of data for the closer examination of which we are all awaiting the published account of the meeting. Professor R. L. Schumacker, in his paper entitled "The mapping of European bryophytes", spread the recording net wider. During the course of it we were shown some intriguing distribution patterns of those species already mapped.

After breaking for lunch, Dr. H.L.K. Whitehouse, the President of the BBS, presented a fascinating insight into recent "Advances in knowledge of the life histories of British bryophytes"

from which the most important recurring feature amongst the mosses was the growing number known to produce protonemal gemmae, facts which have come to notice with the increasing culture of these plants on agar media. Dr. R.E. Longton, the General Secretary of the Society, looked into the light-reflecting cells of the protonema of *Shistostegia* and attempted, in a very stimulating way, to predict "Future developments in bryology", which led very naturally into the final session, an open discussion on "The future of the BBS", which was chaired by the Society's immediate Past-President, Dr. Stanley Greene.

The Annual General Meeting followed after tea. During the AGM the programme of meetings for the next three years was revealed. On the Saturday evening members, and their special guests representing various societies with a strong interest in botany - the Linnean Society of London, the Botanical Society of the British Isles, the British Phycological Society and the British Lichen Society, attended a buffet supper and later a conversazione in the Botany Department of Bedford College, by the kind permission and active support of Professor W. G. Chaloner, FRS. There was an exhibition of interesting bryophyte material, both living and fossil, and photographs of bryophytes, past meetings and of bryological personalities. Interest in IAB was stimulated by Dr. S.W. Greene's display of IAB publications, and Professor P.W. Richards' souvenirs of the Tokyo Bryological Congress.

The next day, Sunday 18th, 70 members defied the persistently wet weather to visit one of the most classical of British bryophyte sites - Boxhill in Surrey - under the leadership of that doyen of the Society, Mr. E.C. Wallace. Unfortunately, the day was not marked by the addition of any new species to the list for the area. A very enjoyable and memorable meeting was brought to a fitting close with tea and homemade cake at the Juniper Hall Field Centre, where many budding bryologists have had their interest stimulated by a variety of teachers in the field and the laboratory.

P.J. Wanstall,
Chairman,
BBS Jubilee Committee,
Department of Plant Biology
and Microbiology, Queen Mary
College, Mile End Road, London,
E1 4NS.

OUT AND ABOUT

In Australasia

FROM NEW ZEALAND, Allan Fife and Bryony Macmillan of Botany Division, DSIR, organized a highly-successful Bryological Foray in the first week of October, 1983. Participants gathered at Pelorus Bridge, Marlborough, and came from as far afield as Auckland and Dunedin. The number of younger participants was most encouraging and it would seem that there is developing a nucleus of keen bryologists under the long white cloud. A detailed report on this meeting by Jessica Beever, will be found in Australasian Bryological Newsletter No. 9.

From Australia news is rather more scattered. Or, with a country like ours, and so few bryologists, it is almost a case of long-distance dispersal! Ilma Stone has been delving into the bryological secrets of northern Queensland and has received support from the Bureau of Flora and Fauna to continue this work. George Scott has also received substantial support from the Bureau for a student to continue studies on *Fossombronina* and for George to work on the hepatics for the Flora of Australia. Graham Bell, in Adelaide, has received funding to work on Pottiaceae for the Flora project.

Thor Bjorn Engelmars was recently in Australia and New Zealand, endeavouring to unravel some of the difficulties of *Dicranoloma*, *Dicranum* and other difficult or devious Dicranaceae! Paddy Dalton and Rod Seppelt missed Thor Bjorn by "a subula" at Mt. Field National Park in Tasmania. Rod visited sub-Antarctic Macquarie Island again in October-November, 1983, and spent the Christmas/New Year period at home, which is something of a change for him, as he has usually been in Antarctica or the high southern latitudes at that time.

R.M. Schuster is reported to be somewhere "down under", chasing elusive hepatics, to further the studies he and John Engel are making on the southern floras. Patricia Selkirk (Macquarie University) has just been appointed as a tenured Lecturer in the School of Biological Sciences. Her Senior Tutor's position terminated at the end of 1983.

George Scott (Monash) has also received a promotion, being elevated to a Readership in Botany. The Australian Academic scale is Lecturer, Senior Lecturer, Reader with the ultimate possibility of a personal chair (Professorship) in recognition of meritorious research achievement.

R.D. Seppelt, Dept. of Bot. and Technology, Antarctic Div. Channel Highway, Kingston, Tasmania 7150.

Techniques Notebook

MEASUREMENT OF MIST

PRECIPITATION

By S. Russell

THOSE READERS present at the Tokyo Congress may remember my mention of a "mist guage" during question time after Rob Gradstein's fascinating paper on the bryophytes of the Sierra Nevada de Santa Maria in Colombia. I suggested that mist guages might usefully be employed in studies where mist and fog precipitation feature prominently in the water budget of a region, at least, more so than rain guages might indicate.

Among the deluge of enquiries that followed, was one from our number one investigative reporter - Janice Glime - who promptly signed me up for a contribution to the "Techniques Notebook". The problem is, search as I may, I cannot find a "standard pattern" mist guage in use by meteorological organisations around the world. In fact, all sorts of peculiar contrivances have been used in the past, including bunches of reeds stuck in funnels (Marloth, 1904) and "1qt. oil cans, 14cc high and 10cc in diameter" (Vogelmann et al, 1968) presumably a misprint!

So, you can forget about strict comparability of results with other regions but, if you just want to get an idea of the contribution of mist precipitation over and above that of rainfall in your area, then there is a successful pattern of "fog catcher" that has been used by weathermen and biologists alike in Southern Africa for many years. A fog catcher is just a guage cylinder (simulating vegetation) on a wire frame fixed above the aperture of a rain guage (see figure). Grunow (1952) settled on arbitrary but sensible dimensions for the cylinder viz.: height twice the diameter and cross-sectional area equal to the catching area of the rain guage. For example, on a 126 mm diameter (5") rain guage, the catcher would have to be 79 mm in diameter and 158 mm high. Nagel (1956), from which my drawing is adapted, gives us the mesh aperture size as 1.35 mm. using 0.25 mm wire. He used 2mm wire for the frame. He also discusses the rather involved physics of the device in relation to wind speed, drop size,

arrival angle, etc., for those of you who can already see theoretical constraints on the use of such a contraption for absolute measurements.

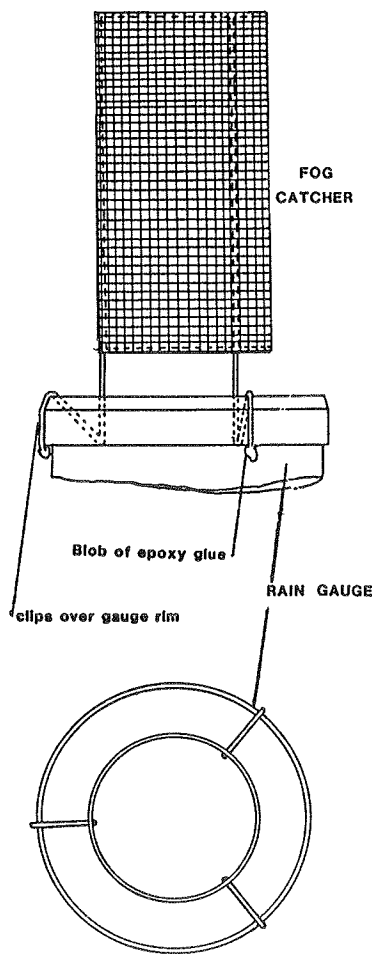


Fig. 1. A fog catcher

Gauges of this pattern have been used with success throughout Southern Africa, for example at the ecological research station at Gobabeb in the fog desert of Namibia, where Don Gaff has noted the presence of a hypolithic bryophyte flora (Scott, 1982). Mist at least doubles the effective precipitation in the Namib and may increase it many times over in habitats such as the cloud-capped summit of Table Mountain (Marloth, 1907). Measurements that I have made in the "mist belt" forest of the Eastern Cape give comparable results, and I would be interested to hear from anyone else who has, or would like to make records of mist precipitation in similar environments.

Please write to me at the address below for a photograph to aid construction of the mist guage, if you are thinking of joining the ranks of "nubulologists" (= fog-watchers!).

References

- GRUNOW, J. 1952. Nebelneiderschlag. Ber. deutsch. Wetterd. U.S. Zone, Bad Kissingen 42: 30-34.
- MARLOTH, R., 1904. Results of experiments on Table Mountain for ascertaining the amount of moisture deposited from the south-east clouds. Trans S. Afr. Phil. Soc. 14: 403-408.
- MARLOTH, R. 1907. Results of further experiments on Table Mountain. Trans. S. Afr. Phil. Soc. 16: 97-105.
- NAGEL, J.F. 1956. Fog precipitation on Table Mountain. Quart. J. Roy. Met. Soc. 82: 452-460.
- SCOTT, G.A.M. 1982. Desert bryophytes. In: A.J.E. Smith (ed.) Bryophyte ecology. London, Chapman and Hall, 105-122.
- VOGELMANN, H.W., T. SICCAMA, D. LEEDY & D.C. OVITT. 1968. Precipitation from fog moisture in the Green Mountains of Vermont. Ecology 49: 1205-1207.

Department of Plant Sciences, Fort Hare University, Alice, Ciskei, South Africa.

A NEW EASY METHOD OF FIXING SPORES ON SEM-STUBS

By Jan-Peter Frahm

THERE ARE SEVERAL METHODS recommended in the literature to fix spores on SEM-stubs. Thomas, R.J. et al. (Stain Technology 49 (5): 261-264, 1974) mount spores "on polished SEM-stubs smeared with the natural oils from one's finger". In my case it might be that the finger smear was not as good as it should be. The result was that the spores were moved off by the vacuum and spores just focussed, for the most part, suddenly dispersed. The usual method is to glue the spores on to double adhesive tape, but with the SEM-model used by us this, too, proved unsuccessful, as the tape made bubbles in the vacuum so it was impossible to focus on the spores. We solved this problem with a fluid named "Microstik" kindly provided by Dr. Horton. It worked perfectly and also gave a wonderfully smooth background to the photographs. Unfortunately this fluid is not available in Germany.

The familiar smell of acetone in the Microstik fluid gave me the idea that [contd. over]

* Column Editor. Janice M. Glime

TECHNIQUES NOTEBOOK (contd.)

we could perhaps experiment with nail varnish, and so I tried a colorless variety. I could, perhaps, have practised with other forms of colorless lacquers, but the fact that nail varnish is sold in little bottles with a brush attached to the cap is obviously an added advantage, as the brush can be passed lightly over the stub, in the same way as "Microstik". The spores must be powdered over the stub within 5-10 seconds of application. The results are as satisfying as with "Microstik".

Universität Duisburg, Fachbereich 6, Botanik Postfach 101629, D-4100 Duisburg, Fed. Rep. of Germany.

MOSSES FOR TEACHING TROPISMS

By

Janice M. Glime

BRYOPHYTES CAN OFTEN make good teaching material for illustrating basic principles in botany. They have the added advantage of being small and thus make large numbers of replicates possible in a small space. Welch (1947) suggested storage and preparation methods for *Polytrichum* spp. for life cycle illustrations. This genus is widely available and commonly used for teaching about mosses. Most commercially-prepared microscope slides of moss life cycles in the USA use species of *Polytrichum* or *Mnium*.

Numerous papers are now available as guides to a wide variety of culture preparations and experiments. (See Nehira 1964; Bopp 1981.)

Funaria hygrometrica is easy to culture and available throughout the world. It grows relatively fast and experiments with gametophores can be completed in 4-5 weeks. Germination experiments are possible in a few days, thus making this moss highly desirable for physiology experiments.

I found *F. hygrometrica* to be a useful experimental organism for determining the effects of wavelength of light on germination and tropisms. Capsules can be collected from wild populations or spores ordered from a supply house. When wild capsules are used, they can be surface-sterilized for 5 minutes in a 5% solution of hypochlorite (clorox), but usually they are clean enough and sterilization

is not necessary. The ultra-violet chamber used by Bopp at the Botanisches Institute, Heidelberg, Germany, can be modified for inexpensive use in a classroom. A table, preferably enclosed (cardboard will do), should be lighted with a UV fluorescent lamp for at least one hour prior to use. A white light should be provided for working. The table and all tools should be cleaned with alcohol or other disinfectant. The working side of the enclosure can be covered with clear plastic with openings for your arms. The table should be equipped with glass slides, forceps, 70% ethyl alcohol, container for dipping slide, empty beaker, alcohol lamp or gas burner, matches, sharp scalpel or razor blade, marker pen. A dissecting microscope is useful but not essential.

Petri plates should be poured in advance with Knop agar (or almost any nutrient agar) + micronutrients. Fill plates at least 2/3 full, because the agar will dry out. These plates can be placed in the UV chamber one hour prior to use, but this is not essential. When you begin work, wash your hands and arms, turn off the UV light and turn on the white light. It is important to remember to do this since UV light will damage your eyes. Place your supply of capsules inside the UV chamber.

A slide is dipped in alcohol, flamed dry and put into a clean glass Petri plate. Forceps and scalpel are dipped and flamed dry. A capsule is placed on the slide, held with forceps, and the seta is cut off and removed. Then the apex (with operculum) is cut off and removed and spores are squeezed into the slide. The capsule is removed, a Petri plate is opened and the slide is picked up with forceps and turned upside down over the plate. The plate is closed and a similar procedure is followed for each plate. Slide, scalpel and forceps should be dipped in alcohol and flamed between each new capsule and plate. Be careful to avoid holding your hands, arms or clothing over an open plate. Remove plates with spores before turning on the UV light.

The Petri plates can have cellophane placed on the agar. This cellophane is permeable to nutrients and can be like the wrap used for wrapping food. Cellophane should be cut in circles to fit the plates, placed in a large beaker of water, covered with aluminum foil, and sterilized for 20 minutes +1 g, 120°C

in the autoclave. Transfer of cellophane to agar is done in the UV chamber after the agar is solid (12-24 hours). The spout side of the beaker is flamed. Cellophane is picked up with a forceps and dragged up the spout side of the beaker until one sheet is separated. This is then slid out of the beaker (it works best if the direction of curling is horizontal) and laid onto the agar. The plate is closed and allowed to dry for several hours. The cellophane can be cut later for easy transfer or individual protonemata can be picked up and transferred. This must be done with alcohol-flamed tools, and the tools can be touched to the agar to cool them before they touch the moss.

For the tropism experiment, plates can be prepared before or after pouring. Layers of paper or thin cardboard can be cut in semi-circles to fit the lids of the plate. Half the lid should be clear and half covered. The covers can be taped with masking tape. The sides of the plate and lid should also be darkened, preferably with a black marker since tape often causes the plate to stick together or to another plate. This design can be modified by covering the top with sections of colored cellophane. Layers of white paper can be added until each section transmits equal light intensity. A photographic light meter can be used to measure incident (not reflected) light through the lid.

Few studies have been done on tropisms in moss gametophores, and this interests students who wish to design their own experiments. *Funaria hygrometrica* gametophores will bend strongly towards light (Fig. 1). Many questions can be asked, such as which wavelengths will cause the response, what is the minimum intensity required, what is the role of gravity, etc. [cont. over]

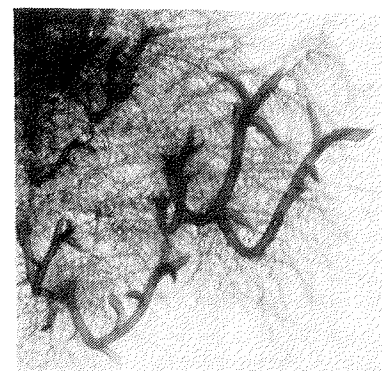


Fig. 1. Young gametophores of *Funaria hygrometrica* bending towards the light source.

TECHNIQUES NOTEBOOK

continued from last page

Secondary contamination is often a problem in experiments of this sort which last 4 - 5 weeks. This can be reduced by wrapping each plate in a sheet of thin white paper such as onion skin, or sealing them with parafilm. Plates should be cultured at 20-22°C with 18-20 hours light per day for the fastest results. Cool, white fluorescent or full spectrum lights (such as Vita Lite from Duro-Test) are best. An intensity of 2,000-4,000 lux will give good growth.

Cultures on agar plates rarely produce sporophytes. However, growing plants in their agar can be transferred to soil or sand and maintained in a greenhouse.

References

- Bopp, M. 1981. Entwicklungsphysiologie der Moose. *Advances in bryology* 1: 11-77.
- Nehira, K. 1964. Culture media for bryophytes. *Bulletin of Biological Society of Hiroshima University* 31: 15-21.
- Welch, W.H. 1947. Moss materials for teaching. *School science & mathematics*, June 1947: 503-506.

Department of Biological Sciences
Michigan Technological University,
Houghton, Michigan 49931,
U.S.A.

EXCHANGE AND MART

WANTED FOR SALE OR LOAN

Boulay, Jean Nicolas, 1872, *Flore cryptogamique de L'Est: Muscinees*, Paris.

ACCORDING TO AN ENQUIRY of the library system of Western Germany, Boulay's book is present in only one place in West Germany, i.e. Beuron, a small town in the south of the country, from where it cannot be borrowed. A loan from libraries in foreign countries is also not possible. The book is, however, needed for a compilation on the bryophytes of the Vosges Mountains (eastern France). Who can loan this book for a short period, or has a copy for sale?

Jan - Peter Frahm, Universität Duisburg, Fachbereich 6, Botanik, Postfach 10 16 29, D-4100, Duisburg, B.R.D.

QUESTION ANSWERED

Note: Richard Zander, Buffalo Museum of Science, Humboldt Parkway, Buffalo, New York 14211, U.S.A., has answered George Geyman's search for a long-lasting mounting medium. He suggests a lactophenol gel. This lasts for about four months, but it can be sealed with various luting compounds for long-term use. See Zander, R., 1983. A rapid microscopic mounting medium for delicate bryophytes *Taxon* 32(4): 618-620 for details.

Read all about it!

AN ENGLISH TRANSLATION of an article from a Japanese newspaper was published in *Australasian Bryological Newsletter* No. 9; 2, 1983. The original article appeared on 5 June, 1983 in a Miyazaki daily paper, and gave an account of the activities of bryologists in Miyazaki prefecture during a World Conference of Bryology Post Congress tour. It was translated by Masao Konagai, a post-graduate student at Macquarie University.

The same newsletter also carries an account, on pp. 3-5 by Jessica Beever, of a week-end bryological foray at Pelorus Bridge, Marlborough, South Island, New Zealand, Sept. 30 - 2 Oct, 1983.

BLUE MOUNTAINS BRYOPHYTES

HELEN RAMSAY, PATRICIA SELKIRK and ALISON EDGEcombe are compiling information on bryophytes of the Blue Mountains, New South Wales, Australia. They would be delighted to receive specimens from anyone who has collected from the area e.g. during XIIIth Botanical Congress field trips, Aug-Sept. 1981. Specimens will be lodged in either the National Herbarium of N.S.W. or the John T. Waterhouse Herbarium at University of N.S.W.

Please send information and/or specimens to:

- Dr. H.P. Ramsay, Botany Department, University of N.S.W., Kensington 2033, Australia.
- or Dr. P.M. Selkirk, School of Biological Sciences, Macquarie University, North Ryde, 2113, Australia.
- or Miss A.J. Edgecombe, School of Biological Sciences, Macquarie University, North Ryde 2113, Australia.

Mosses of Ecuador

WILLIAM CAMPBELL STEERE (New York Botanical Garden, Bronx, New York 10458, U.S.A.) wishes to examine and identify any collections, large or small, of undetermined mosses from Ecuador, now in the hands of individuals or institutions. Please send such material to him, on loan, at the above address. He also wishes to know the whereabouts of named collections of Ecuadorian mosses in private or institutional herbaria that have not yet been included in published reports - and he would be grateful for the privilege of reviewing such material, on loan.

For many years he has been accumulating information and specimens for a major floristic and bryogeographic report on the mosses of Ecuador, which will bring up to date his 1948 review of all mosses reported from that country (*Bryologist* 51: 65-167). Instead of being based on literature citations, the new report, now in preparation, will deal with actual specimens. To date, the specimens considered are the result of collections made by Steere during more than a year in Ecuador (1943-1944) and during his shorter subsequent visits (1981, 1982, 1983). All these collections have been determined, and are deposited at New York. Further collections have been sent for identification by the University of Aarhus (AAU), the result of several recent Danish botanical expeditions to Ecuador, and by the P. Universidad Católica del Ecuador (QCA). However, there must certainly be still further collections of Ecuadorian mosses unknown to Steere that should be included in his report, and to learn about them is the purpose of this note.

BRITISH BRYOPHYTES AVAILABLE ON EXCHANGE

THE HERBARIUM of the Plant Science Laboratories, University of Reading (RNG) is keen to increase the coverage of its bryophyte herbarium and for this purpose has collected British bryophyte material for exchange with other institutions. Sets of a first century of British taxa are now available and the second century is being accumulated. Miscellaneous bryophyte duplicates from the Mediterranean area are also available. Anybody interested in exchanging material with the University of Reading is invited to contact the Curator, Dr. S.L. Jury, Plant Science Laboratories, University of Reading, Whiteknights, Reading, Berkshire RG6 2AS, U.K.

AMERICAN BRYOLOGICAL AND LICHENOLOGICAL SOCIETY
ANNUAL MEETING IN CONJUNCTION WITH THE 35TH ANNUAL MEETING OF
THE AMERICAN INSTITUTE OF BIOLOGICAL SCIENCES

Fort Collins, Colorado, 5-9 August, 1984.

The 1984 Annual Meeting of the American Bryological and Lichenological Society will feature a half-day symposium "Species Concepts in Bryophytes: Traditional and Innovative Approaches," which is co-sponsored by the ABL and Bryological and Lichenological Section of the Botanical Society of America. The symposium will be followed by as many sessions of contributed papers as required. Also, there will be an opportunity for members to participate in a poster session which, if possible, will be scheduled at a time when there is no conflict with the symposium or any of the contributed paper sessions. The Bryologists' and Lichenologists' Breakfast is scheduled for Monday, August 6.

Further information from Dr. Norton G. Miller, Biological Survey, New York State Museum, Albany, NY 12230, (Tel. (518) 474-5812)

TAXONOMIC PROJECTS IN DUISBURG

WITH THE SUPPORT of the German Research Foundation, Dr. Jan-Peter Frahm has started a two-year revision of the African *Campylopus* species, of which approximately 170 have been described.

Under his supervision, Miss Monika Giese has finished revisions of *Campylopodium* and *Microcampylopus* which have given new perspectives of the inter-relationships of both genera and the distribution of their taxa. Miss Giese will continue her study of *Campylopodioideae* in Duisburg with a monograph of the genus *Dicranodontium* for a Ph.D degree. Miss Monika Padberg is currently undertaking a worldwide study of the genus *Atractyllocarpus* for the Bryotrop project. These critical revisions will help to give a basic understanding of the taxonomy and distribution of these genera and their systematic arrangement within the subfamily *Campylopodioideae*.

The loan of herbarium material (both identified and unidentified) as well as the receipt of living specimens would be very much appreciated.

Jan-Peter Frahm, Universität Duisburg, Fachbereich 6, Botanik Postfach 10 16 29, D-4100 Duisburg, B.R.G.

Personalia

S. C. BHATLA of the Department of Botany, Delhi University, India, has joined the laboratory of Professor Martin Bopp, Botanisches Institut, Heidelberg, W. Germany, as a Fellow of the Alexander von Humboldt Foundation. He will be working on the hormonal regulation of protonema differentiation in mosses.

NEWS FROM VÁCRAÓTÓT, HUNGARY.

MR. JAN MEENKS from Utrecht, finished his nine-month work on Cuban and other neo-tropical Aneuraceae in February.

Other foreign bryologists who visited Vácraótót in January 1984 were: Ryszard Ochryra (Kracow) for a study of Kilimanjaro mosses; Guido van Reenan (Utrecht) to study and discuss ecology of tropical bryophytes, and Harrie Sipman (Berlin) to join discussions and work on tropical lichens. Dr. T. Pócs intends to leave on 16th February on his delayed trip to Tanzania.

Deaths

GIER, Leland J., on 11th July, 1983 in Cartage, Missouri, U.S.A.

S.W. GREENE hopes to visit the eastern seaboard of the United States during May 1984, and will spend time in the Farlow, the New York Botanical Garden, the Hunt Botanical Library, the Smithsonian Institution, as well as other centres. He hopes to meet as many bryologists as possible and would be happy to send details of his itinerary to anyone who would like to arrange a meeting.

P.J. LIGHTOWLERS, of the Institute of Terrestrial Ecology, Bush Estate, Penicuik, Midlothian, Scotland, has successfully defended his thesis "Taxonomic studies in Antarctic bryophytes with particular reference to the genus *Tortula*" for the degree of Doctor of Philosophy in the University of Edinburgh.

Recent Publications

Australasian Bryol. Newsletter No. 9, 1-5, 1983.

Bull. Br. Bryol. Soc. No. 43: 1-34, 1984.

Cryptogamie Bryol. Lichén 4 (4): 299-390, 1983.

J. Bryol. 12 (4): 535-654, 1983.

Crosby, M.R. & C.R. Bauer, 1983. Index muscorum supplementum: 1980-1981. Taxon 32(4): 670-691.

International Code of Botanical Nomenclature Adopted by the Thirteenth International Botanical Congress, Sydney, August 1981. Regnum veg. 111: 1-472, 1983.

From Hattori Botanical Laboratory

Schuster, R.M. (ed.) 1983 - 84. New manual of bryology, Vol. 1, c. 630pp. issued December 1983, price US \$45 or ¥10,500. Vol. 2, c. 670pp. issued January 1984, price US \$50 or ¥11,660.

Both prices inclusive of postage via sea mail.

DIARY

BBS = British Bryological Society; BLAM = Bryologisch-Lichenologische Arbeitsgemeinschaft f. Mitteleuropa; CEBW = Central & East European Bryological Working Group; DBLW = Dutch Bryological & Lichenological Working Group; IBC = International Botanical Congress; SBLS = Swiss Bryological and Lichenological Society.

1984

April 11-18. BBS. Spring Field Meeting, Brecon, South Wales. Local Sec.: Mr. P.J. Port, Hollybush Cottage, Newton Lane, Kington, Hereford and Worcester. For details, see Bull. BBS 43, 13.

April 28-1 May. DBLW. Spring Field Meeting, Belgian Ardenes around Dinant, jointly with Belgian bryologists. Further information from: Huub van Melick, Merellan 13, Valkenswaard, The Netherlands.

May 12-13. SBLS & BLAM, Westlichen Bodensee-Gebiet. SBLS Annual assembly with a joint SBLS & BLAM field trip. Leaders Alfons Schaefer-Verwimp and his wife Inge Verwimp. [contd. over]

DIARY [contd. from last page]

Schienerberg, southern Germany and Ittinger Wald (Thurgau, Switzerland). Further details from Dr. K. Ammann, Syst.-Geobot. Institut, Altenbergrain 21, CH-3013, Bern, Switzerland or Dr. G. Philippi, Landessaml. f. Naturkunde, 7500 Karlsruhe, B.R.D.

18-20 May. BLAM. Bryologische Exkursion im Harz. Leader W. Heimhold. Registration by 1st April to W. Heimhold, Rottenweg 4, Langelshelm 1, B.R.D.

June 4 - 6 July. Course in Field Bryology to be taught by Dr. Lewis E. Anderson at Highlands Biological Station, North Carolina. Further information in Bryol. Times 23: 8, and from Dr. Richard C. Bruce, Director, Highlands Biological Station, P. O. Drawer 580, Highlands, North Carolina 28741, U.S.A. Tel. (704) 526-2602.

July 18-25. BBS. Summer Field Meeting, Wooler, Northumberland. Local Sec.: Dr. P.J. Lightowers, Institute of Terrestrial Ecology, Bush Estate, Penicuik, Midlothian EH26 0QB, Scotland. Details in Bull. BBS, 43:13.

July 21-31. DBLW. Summer Field Meeting in the Vosges (Lüttenbach). For further information (and registration before 1st April), contact Han van Dobben, Mariaplaats 16, Utrecht 3111 LJ.

Aug. 3-5. ABLIS Foray. Rocky Mountain National Park, Estes Park, Colorado. Based on the LAZY T Motor Lodge, Estes Park. Foray reservations and further particulars from Roger A. Anderson, Dept. Biol. Sciences, Univ. Denver, Denver CO

80208, U.S.A. or Dr. Sam Schushan, E.P.O. Biol., Dept. Mail Code 334, Univ. Colorado, Boulder, CO 80309, U.S.A.

Aug. 5-9. ABLIS. Annual Meeting Fort Collins, Colorado. For details see this issue p. 7.

Aug. 13-24. Summer course in Bryology and Lichenology, Universities of Liège and Utrecht. Station Scientifiques des Hautes Fagnes, Mont Rigi, B-4898, Robertville, Belgium. Further particulars from Prof. R. Schumacker at the above address.

Aug. 20-24. VIIIth. International Symposium on Sexual Reproduction of Seed Plants, Ferns and Mosses. Wageningen. Further information from Profs. J.L. van Went and M.T.M. Willense, Arboretumlaan 4, 6703 BD, Wageningen, The Netherlands.

Aug. 23-28. SBLIS. Field Meeting, Val Piora, Ticino (central Alps SE of St. Gotthard), Switzerland. Further details from Dr. K. Ammann, Syst.-Geobot. Institut, Altenbergrain 21, CH-3013, Bern, Switzerland.

Sept. 15-16. BBS Paper-reading Meeting and AGM. University of Birmingham. Local Sec.: Dr. D. C. Lindsay, 20 Gibbs Hill Road, West Heath, Birmingham B31 3NZ. For details see Bull. BBS, 43:14.

Nov. 17-18. BBS. Taxonomic Workshop. University of Keele. Local Sec.: Dr. R. Murphy, 73, St. Christopher Ave., Penkull, Stoke-on-Trent ST4 5NA. For details, see Bull. BBS, 43:14.

For details of BBS local Meetings and Bryophyte Courses at Field Studies Council Centres, see Bull. BBS, 43:15.

1985

April: BBS. Spring Field Meeting. Chichester, West Sussex. Local Sec.: Mr. R. C. Stern, 14, Cherry Avenue, Yapton, Arundel West Sussex, BN18 0LB. Preliminary details in Bull. BBS, 43:14.

July 4-10. IAB Brighton, England. Third International Congress of Systematic and Evolutionary Biology.

July 28-3 Aug. BBS. Summer Field Meeting, Bavarian Alps. Local Sec.: Prof. Dr. R. Düll, Lehrstuhl f. Biologie (Botanik), D. Pädagog. Hochschule, 4100 Duisburg 1, Lotharstrasse 65, B.R.D. Preliminary details in Bull. BBS, 43:14.

August 5-10. IAB. Budapest and Vác. Conference on Bryoecology. For 1st circular, see Bryol. Times 24:7.

August 12-14. CEBWG, Eger, Hungary. 4th Biennial Meeting. For 1st circular, see Bryol. Times 24:7.

September. AETFAT. St. Louis. Proposed mini-symposium on African bryophytes. For further information see Bryol. Times 23:8.

1987

July 24-1 Aug. XIVth IBC Berlin (West). Preceded by IAPT Nomenclature Sessions, July 20-24. For preliminary notice, see Bryol. Times 23:9.

Congress Address: XIV IBC. Bot. Garden & Museum, Königin-Luise-Strasse 6-8, D-1000, Berlin (West) 33, Germany

THE INTERNATIONAL ASSOCIATION OF BRYOLOGISTS publishes The Bryological Times every two months and the Advances in Bryology every two years. Material for The Bryological Times can be sent at any time, but submission dates for the Advances should be discussed with its editor, Dr. Schultze-Motel (Berlin). 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, Instituut voor Systematische Plantkunde, Heidelberglaan 2, 3584 CS Utrecht, The Netherlands.

THE BRYOLOGICAL TIMES is published in Utrecht and distributed from Beijing (China), Kingston (Tasmania), Missouri (USA), Reading (UK), Tokyo (Japan), Vác (Hungary) and Utrecht. All correspondence concerning mailing to: M.A. van Slageren, Instituut voor Systematische Plantkunde, Heidelberglaan 2, 3584 CS Utrecht, The Netherlands.

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 1st April at the latest. Items for the Techniques Notebook should be sent direct to Dr. Janice Glime, Dept. of Biological Sciences, Michigan Technological University, Houghton, Michigan 49931, U.S.A.