

the Bryological Times



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Bryology at the Herbarium of the University of Göttingen, Germany

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The Herbarium of the University of Göttingen (GOET), established in 1832, is one of the main university herbaria in Germany containing almost 700,000 plant specimens. Of these about 50,000 are bryophytes and 30,000 lichens, mostly from Europe with some classical collections from the tropics (but see below). Because of the very small curatorial staff, many specimens are in need of mounting and repackaging but it is hoped that this situation can be somewhat improved in the future. The herbarium has important historical collections and is rich in types, especially of flowering plant species. Important plant collections include those of F. Ehrhart (p.p.), A. von Haller (p.p.), G. Forster (p.p.), A. Grisebach, H. Solms-Laubach, G.F.W. Meyer, Beyrich (N. America), Kegel (Suriname), Lindig (Colombia), Balansa (Paraguay) and Zenker (Cameroon). The herbaria of A.H. Schrader (1767-1836) and G.F. Hoffmann (1760-1826), professors of botany in Göttingen and authors

of many plant species including bryophytes, are unfortunately not in Göttingen but went to Russia. A detailed description of the holdings of the herbarium with biographical details of the collectors has been published by Professor Gerhard Wagenitz, Director of the Herbarium from 1969 until 1995 (Wagenitz 1982). Copies of this publication are available on request.

With the appointment of the author as the new Director of the Herbarium, initiatives are being taken to develop an active program in bryology in Göttingen. New herbarium compactors have been constructed and the tropical bryophyte and lichen collections from Utrecht (ca. 50,000 specimens), with the exception of mosses of the Guianas, have been transferred to Göttingen on a long term loan. A research facility for bryology is being created, with working space for students and for visitors interested to consult the herbarium. Guestrooms are available in the institute for short-term

visits.

Several young researchers have begun bryological investigations associated with the Herbarium. Elena Reiner-Drehwald, who received a PhD from the University of Buenos Aires in December 1995 with a dissertation on the "*Lejeuneaceae* of Misiones, Argentina", has been hired as a research assistant. She will continue research on neotropical *Lejeuneaceae* with revisionary studies on the large genus *Lejeunea*. New PhD projects include monographs of neotropical *Plagiochila* sect. *Superbae* (Jochen Heinrichs) and *Ceratolejeunea* (Gregorio Dauphin, Costa Rica), and a study on the ultrastructure and taxonomic relevance of the sporophyte in the *Lejeuneaceae* subfam. *Lejeuneoidae* and the *Jubulaceae* (Gabriele Weis).

Rob Gradstein is busy finishing the illustrated *Guide to the bryophytes of tropical America*, written with a grant

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More bryophyte eating insects

We read with interest "Tracing a hornwort-consuming beast" by Irene Bisang in the January edition (1996, vol. 86) of the *Bryological Times*. Over the last three years we too have had our cultivated bryophytes eaten by the larvae of Diptera.

Over the last three years we have grown bryophytes experimentally in the

university glasshouses. Our interests have been in bryophytes which grow on calcareous substrates and we have found that we can successfully grow most of these species in a layer of untreated, calcareous soil about 1 cm deep over a base of steam/air treated coarse sand in a 10 cm diameter plastic nursery pot. These are watered with demineralized water and covered with glass sheets to minimise the contamination by spores of bryophytes which grow as glasshouse weeds.

We were successful with our bryophyte propagation, and like Irene Bisang our cultures included many species of Bryaceae, especially *Bryum argenteum*, *B. dichotomum* and *B. pachytheca*. We were horrified to find, one morning, that our luxuriant pots looked rough, patchy and almost as if they had been ploughed by a miniature cultivator. At first we suspected a fungal infection, however the small, white fly larvae, which lived under the surface of the soil became apparent when the pots were examined with binocular microscope, probably surfacing in response to the warmth of the microscope light.

The flies were identified for us by entomologist Eran Turak, as fungus gnats or sciarid flies. The larvae of fungus gnats (*Bradysia* sp., Family: Sciaridae, Order: Diptera, Class: Insecta) are known to feed on root hairs of young seedlings, especially in glasshouse situations where the soil is kept constantly moist (Colless and McAlpine 1991, McMaugh 1986). They are also a problem in the mushroom industry in Australia. In our case, they appear to eat the rhizoids of the mosses, causing the collapse of the plant.

We were driven frantic trying to control the sciarid flies without causing further damage to our bryophytes, until Dr. Mary Ann Terras of the New South Wales Department of Agriculture, came to our rescue. As part of her research work in the mushroom industry she was able to recommend a larvacide, Alsystirin 250 by Bayer (active constituent - 250 g/kg Triflumuron). We drenched our

pots in a solution of 2 grams of Alsystirin in 10 litres of water and found that within two weeks our bryophyte populations had grown back to their former luxuriance. Alsystirin is a very safe chemical to use and breaks the breeding cycle of the sciarid flies rather than acting as a poison. We now find that it is sensible to drench our pots every three to four weeks as a precaution. We would also like to add a note of caution. Approval for use of agricultural chemicals varies from country to country and advice should be sought before use.

We hope that this information will be useful to others experiencing similar difficulties.

REFERENCES

Colless, D. H. & McAlpine, D. K. 1991. Diptera (Flies). In: *Insects of Australia*. C.S.I.R.O. Volume II. 2nd Edition. Melbourne University Press, Melbourne.

McMaugh, J. 1986. *What Garden Pest or Disease is That?* Companion Edition. Lansdowne Press, Brisbane. 302 pp.

Alison Downing & Patricia Selkirk, School of Biological Sciences, Macquarie University, Sydney, New South Wales 2109, Australia.

Bryaceae Wanted!

We are investigating phylogenetic relationships among members of the Bryaceae and related families using DNA sequence data. We would appreciate fresh or recently collected material of these taxa from all parts of the world, but especially from tropical and south-temperate areas. Specimens up to 5-8 years old are normally still useable for our work. Particularly critical groups for our analyses include *Acidodontium*, *Bryum blandum*-*B. cellulare* and allies, *Brachymenium*, and *Schizymenium* so we are especially anxious to obtain material of these. Please contact us if you would like more information on the project.

Terry A. Hedderson and Cymon J. Cox. Department of Botany, School of Plant Sciences, University of Reading, Reading, England, RG6 2AS.
e-mail t.a.j.hedderson@reading.ac.uk

Bryology in Göttingen

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from the European Community and co-authored by Steve Churchill and Noris Salazar Allen. The 2-year project is co-ordinated by Geert Raeymaekers (Brussels). The *Guide* provides keys, descriptions, and illustrations for all the neotropical genera of hepatics and mosses, with details on their importance as biodiversity indicators. A draft version of the hepatic part, illustrated by Elena Reiner-Drehwald, has already been distributed to specialists for testing of keys. A Spanish translation was prepared by Noris Salazar, for use in the "Tropical Bryophyte Workshop" held in Panama, 11-24 March, 1996. The workshop, attended by students from all over Latin America, was also sponsored by the European Community.

The first publication of the new bryological research facility in Göttingen is Fascicle 7 (no. 301-350) of *Bryophyta Neotropica Exsiccata*. This exsiccata is available on an exchange basis to institutional herbaria. In return, the Herbarium of the University of Göttingen would like to receive an equivalent number of identified specimens, preferably from tropical or southern hemispheric regions, or some bulk material of neotropical bryophytes large enough to make 50 duplicates. A limited number of sets are still available. Curators of herbaria interested to receive the exsiccata should contact the author. Please indicate what kind of specimens you can send in return.

REFERENCE

Wagenitz, G. 1982. Index Collectorum Principalium Herbarii Göttingensis. Systematisch-Geobotanisches Institut, Georg-August-Universität Göttingen, 214 pp.

ABLS meeting

Enclosed is the draft program for the upcoming American Bryological and Lichenological Society meeting (in conjunction with the Bryological and Lichenological Section of BSA) at the AIBS meeting in Seattle, Washington, 4-8 August 1996. As you can see, this will be an unusually large meeting for ABLs. There will be three full days, with 50 contributed papers (36 of

which are student papers competing for the Sharp award), plus the 9 presentations in the symposium, 12 posters, 2 panel discussions, and 4 workshops. The abstracts will appear in a supplement to *The American Journal of Botany*.

If you are giving a presentation you can check the time here. If you are giving a poster, the size of the poster boards is 8 ft from left to right and 4 feet up and down; authors should bring their own push pins.

As you will recall, the focus of this year's meeting is "The Student," defined broadly to include graduate students, undergraduates, and amateurs. We have made a special effort this year to attract all students interested in these organisms, to interact socially and scientifically, and thus to promote the future of the Society and the Section. To assist this effort, at the ABLs meeting last summer the membership voted to provide an extraordinary number of student travel awards. For this meeting only, all duly registered graduate and undergraduate students that give presentations can receive travel awards (not exceed a \$5000 maximum from ABLs). The Bryological and Lichenological Section of BSA is pooling its allocated funds with those of ABLs to further support student travel awards.

The number of student submissions was truly extraordinary, and exceeded our most optimistic projections. We have therefore had to prorate the student travel awards somewhat. Of the 39 duly registered graduate and undergraduate students who asked for support, there are 13 "local" students who live within 700 miles of the meeting (I set this radius so

as to include my own students, to be fair) -- we can reasonably expect them to drive together in groups and share expenses. So, we have awarded them \$100 each. Then, we have awarded the remaining 26 distant students \$175 each. Individual notifications are being "snail-mailed." Even though this is less than the hoped-for \$200, I sincerely hope that you will still be able to come. Perhaps you can supplement this amount with funds from your home university. The ABLs travel awards will be presented at the meeting itself by the Secretary-Treasurer, Dr. Robert Thomas.

We have not made membership in ABLs a prerequisite for receiving a travel award, because the whole point was to draw in students who might not have participated in ABLs activities before. However, we suggest you consider the benefits of joining your professional organization. Annual dues for students are only \$5 -- to receive *The Bryologist* is only an additional \$30 and *Evansia* is only an additional \$5. Sample copies of these journals, as well as membership information, will be displayed at the meeting.

AIBS is somewhat late this year in getting out their brochure (that gives all registration details), but they assure me it is going out momentarily. It will automatically be mailed to all current members of ABLs, and the other societies that are participating. It will also appear in *BioScience* magazine. It is your responsibility to find a copy of the brochure and take care of your own registration, housing, etc. If you do not get a brochure otherwise, then please write to Marilyn Maury at AIBS (1444 Eye Street, NW, Suite 200, Washington, DC 20005; mmaury@aibs.org) to get one.

This meeting promises to be an exciting one scientifically, and because of the focus on students it should be important to the future of our discipline. I look forward to seeing you there!

Sincerely yours, Brent D. Mishler, President-Elect, American Bryological and Lichenological Society

DRAFT PROGRAM:

MONDAY MORNING, 5 AUGUST

7:00 ABLs BREAKFAST:

SESS CONTRIBUTED PAPERS: A.J. Sharp Student Papers. BRENT D. MISHLER, University of California, Berkeley, presiding.

KONOPKA, ANASTASIA S.*, HERENDEEN, PATRICK S., SMITH MERRILL, GARY, L. and CRANE, PETER R. University of Illinois and Field Museum, Chicago. Three-dimensionally preserved moss sporophytes and gametophytes from the Late Cretaceous.

SZTEIN, A. ESTER*, RIBNICKY, DAVID M., COHEN, JERRY D. and COOKE, TODD J. University of Maryland and USDA, Beltsville, MD. Auxin metabolism in lower land plants.

O'BRIEN, T.J. University of California, Berkeley. The index of dispersion as an estimator of a molecular clock in bryophytes.

COOK, MARTHA E.* and GRAHAM, LINDA E. University of Wisconsin-Madison. Toward an elucidation of the evolutionary origin of plant cuticle.

SPEER, BRIAN R. University of California, Berkeley. Systematics of *Targionia* and the Marchantiales (Hepaticophyta).

WHEELER, JOHN A. Oregon State University. The phylogenetic position of *Riccia* based on partial sequence of the nuclear-encoded Large Subunit rDNA.

WITHEY, ALISON. Duke University. Phylogenetic relationships among the Spiridentaceae (Musci) based on morphological data.

PEDANO, GREGORY. Missouri Botanical Garden. A quantitative study of the Genus *Ctenidium* (Musci: Hypnaceae) in eastern North America.

COLACINO, C.* and MISHLER, BRENT D. University of California, Berkeley. Preliminary results from ITS sequence data analysis in the genus *Syntrichia* (Musci: Pottiaceae).

MCMURRAY, JOHN. University of California, Berkeley. Character analysis and character-state delimitation in *Thelia* (Musci).

MANSI, MOSTAFA A. University of California, Berkeley. Phylogeographic studies of widely disjunct populations of *Eucladium verticillatum* (Musci: Pottiaceae).

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ABLS meeting*Continued from page 3*

THERRIEN, JAMES P.*, STOTLER, RAYMOND E., and CRANDALL-STOTLER, BARBARA J. Southern Illinois University. The *Porella platyphylla* and *P. platyphylloidea* species complex - an analysis of genetic and morphological variation.

THOMPSON, JAMES D. Southern Illinois University. The significance of spore morphology in the *Phaeoceros laevis* (L.) Prosk. species complex.

**MONDAY AFTERNOON,
5 AUGUST**

CONTRIBUTED PAPERS: A.J. Sharp Student Papers (cont.). DIANNE FAHSELT, University of Western Ontario, presiding.

MARSH, JANET E.*, DEPRIEST, PAULA T. and NASH III, THOMAS H. Arizona State University. A cladistic classification of the Ramalinaceae (lichenized Ascomycotina) using morphological, molecular and combined data sets.

LaGRECA, SCOTT. Duke University. A phylogenetic evaluation of chemical variation in the *Ramalina americana* complex based on rDNA sequence data.

TREMBLEY, MARCELLA L* and FAHSELT, DIANNE. University of Western Ontario. Localization and retention of uranyl ions after aqueous washing of *Cladina rangiferina* (L.) Harm.

WITT, RICHARD. University of Nebraska at Omaha. The effects of selected lichen extracts and purified lichen compounds upon isolated tissue from the rat heart.

DAVIS, WILLIAM C. Arizona State University. The photosynthesis response of the aquatic lichen *Hydrothyria venosa* as a function of water temperature.

ROMAGNI, JOANNE G.*, GRIES, CORINNA, NASH III, THOMAS H., KUHN, UWE, and KESSELMEIER, JEURGEN. Arizona State University, Tempe and Max Planck Institute for Chemistry, Mainz, Germany. The release of H₂S in response to SO₂ fumigation of seven lichen species.

SWANSON, ANDREW* and FAHSELT, DIANNE. University of Western Ontario. Effects of ultraviolet irradiation on phenolic levels in *Umbilicaria americana*.

GLEW, KATHERINE A. University of Washington. Lichen diversity in selected alpine sites of western Washington.

BARAHONA, EDUARDO M.* and NORRIS, DANIEL H. Universidad Católica, Quito, Ecuador and University of California,

Berkeley. Moss Flora of the Cordillera Costal, Ecuador.

NEWBERRY, CLAYTON C. University of California, Berkeley. Mosses of Salmon-Challis National Forest and adjacent Frank Church - River of No Return Wilderness Area in north-central Idaho.

CONTRIBUTED PAPERS: Joint student session: A.J. Sharp Student Papers (ABLS, cont.) and Katherine Esau Award Competition (Development and Structural Section). BARBARA J. CRANDALL-STOTLER, Southern Illinois University, presiding.

HORNER, PEDER E.* and CHRISTIANSON, MICHAEL L. University of Kansas. Lysine plus threonine selection for feedback-insensitive aspartokinases in *Funaria hygrometrica*.

KOBIYAMA, YUKI. Southern Illinois University. Specialized "pitted" cells in thalli and archegoniophores of the liverwort *Conocephalum* Hill.

BRAY JR., JAMES*, and CRANDALL-STOTLER, BARBARA J. Southern Illinois University. Culture induced phenovariation in *Fossombronina* Raddi.

NEWBERRY, CLAYTON C. University of California, Berkeley. Morphogenesis and architecture in *Dendroalsia abietina* (Hook.) Britt.

BLACKMER, JOHN. Harvard University. The developmental progression of establishment in soredia of *Cladonia grayi*.

ABLS Executive Council Meeting.

TUESDAY MORNING, 6 AUGUST

CONTRIBUTED PAPERS: A.J. Sharp Student Papers (cont.). B. McCUNE, Oregon State University, presiding.

PETERSON, ERIC B.* and McCUNE, BRUCE. Oregon State University. Differences in responses of macrolichen diversity and species composition to forest management in the Oregon Coast Range.

BIEN, WALTER. Drexel University. Seasonal growth patterns and niche dynamics of two interacting Sphagnum species from the New Jersey Pine Barrens.

RAMBO, THOMAS R.* and MUIR, PATRICIA S. Oregon State University. Diversity and ecology of forest floor bryophytes in *Tsuga heterophylla* zone stands of western Oregon.

PECK, JERILYNN E.*, McCUNE, BRUCE, and MOLDENKE, ANDREW. Oregon State Univ. Epiphytes, invertebrates, and hosts associated with commercial moss harvest, northwestern Oregon, U.S.A.

CLEAVITT, NATALIE*, BATTLES, JOHN J. and FAHEY, TIMOTHY J. Cornell

University. Bryophyte distribution factors within two *Tsuga canadensis* (L.) Carr. dominated ravines in the Delaware Water Gap National Recreation Area.

CONRAD, SHAWN T. Southern Illinois University. Reproductive ecology and diaspore bank of the liverworts of a bald cypress swamp.

PONZETTI, JEANNE M.* and McCUNE, BRUCE. Oregon State University Effects of grazing on biotic soil crust composition in Oregon's steppe region.

ROSSO, ABBEY L.*, MUIR, PATRICIA S., and McCUNE, BRUCE. Oregon State University. Diversity of shrub epiphytes in relation to stand management in the Coast Range, Oregon.

PANEL DISCUSSION: Graduate student oriented session on training and employment issues. Organized by TERRY O'BRIEN, University of California, Berkeley.

O'BRIEN, T.J. University of California, Berkeley. Training and employment of bryologists and lichenologists.

WORKSHOP: National Science Foundation grant opportunities and proposal-writing, with special reference to graduate students

**TUESDAY AFTERNOON,
6 AUGUST**

SYMPOSIUM: Regeneration Niche: Dispersal and Establishment of Bryophytes and Lichens. Organized by ROBIN W. KIMMERER, SUNY, Syracuse and DALE VITT, University of Alberta. ROBIN W. KIMMERER, SUNY, Syracuse, presiding.

KIMMERER, ROBIN W. SUNY, Syracuse. Bryophyte community structure and the regeneration niche.

McALISTER, SUZANNE D. Oklahoma State University. Experimental establishment of lignicolous bryophytes in the greenhouse and forest.

NEWTON, ANGELA E.* and MISHLER, BRENT D. Smithsonian Institution and University of California, Berkeley. Influence of mature plants on establishment, and the evolution and ecology of asexual reproduction in mosses.

STARK, LLOYD R. University of Nevada, Las Vegas. A phenological perspective on spore dispersal in mosses.

O'BRIEN, T.J. University of California, Berkeley. Plasticity, life history traits and phylogeny in the moss *Aulacomnium* Schwaegr.

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ABLS meeting*Continued from page 4*

YOUNG, CRAIG C.* and KIMMERER, ROBIN W. SUNY, Syracuse. Establishment success and shoot relative growth rate as determinants of community structure in saxicolous bryophytes.

FREGO, KATHERINE A. University of New Brunswick. Regeneration in the feather moss community.

LI, YENHUNG* and VITT, DALE. University of Alberta. The dynamics of moss establishment in peatlands.

MARINO, PAUL. Specialized habitats: establishment and dispersal of Splachnaceae

ABLS MIXER.

WEDNESDAY MORNING, 7 AUGUST

CONTRIBUTED PAPERS: The Biology of Bryophytes and Lichens. LLOYD R. STARK, University of Nevada, Las Vegas, presiding.

CRANDALL-STOTLER, BARBARA*, KLAVINS, SHARON D., and CRANE, PETER R. Southern Illinois University and Field Museum, Chicago. An anatomically preserved, complex thalloid liverwort from the early Cretaceous, Puddledock flora of Virginia.

STOTLER, RAYMONDE*, CRANDALL-STOTLER, BARBARA J., and DAVISON, PAUL G. Southern Illinois University and University of North Alabama. The genus *Pellia* Raddi in the southeastern United States.

WHITTEMORE, ALAN T. Missouri Botanical Garden. The taxonomy of *Targionia* (Targioniaceae) in North America.

ENGEL, JOHN J.* and SMITH MERRILL, GARY, L. The Field Museum, Chicago. A phylogenetic study of the genus *Balantiopsis* (Balantiopsaceae, Hepaticae).

McLEITCHIE, NICHOLAS D. University of Kentucky. Why are there so few males?

FAHSELT, DIANNE. University of Western Ontario. Intrathalline heterogeneity of hyphae in lichens as viewed by field emission scanning electron microscopy.

BENNETT, JAMES P.*, DIBBEN, MARTYN J. and LYMAN, KEVIN J. National Biological Service and Milwaukee Public Museum. Element concentrations in *Hypogymnia physodes* after three years of transplanting along Lake Michigan.

McCUNE, BRUCE*, NEITLICH, PETER N., and PETERSON, ERIC B. Oregon State University. Potential for creative

thinning to improve epiphyte habitat in young managed forests west of the Cascade crest.

MUIR, PATRICIA S.*, PATRIE, JAMES, and SHIRAZI, ABBAS S. Oregon State University. Seasonal growth dynamics in the lichen *Lobaria pulmonaria*.

HAMMER, SAMUEL. Boston University. Form in *Cladonia*: does it matter?

McCARTHY, DANIEL. Brock University. Habitat selection and ecology of *Xanthoria elegans* in glacier forefields of the Canadian Rockies.

NORRIS, DANIEL H. University of California, Berkeley. The California-Oregon border – a major break in the distribution of many bryophyte species.

DE LUNA, EFRAIN. Instituto de Ecología, Xalapa, Veracruz. Patterns of morphological variation in *Braunia* (Hedwigiaceae) from Mexico and Central America.

CHRISTIANSON, MICHAEL L. University of Kansas. Evidence for a third cytokinin-mediated event during bud formation in *Funaria hygrometrica*.

WEDNESDAY AFTERNOON, 7 AUGUST

POSTER SESSION: The Biology of Bryophytes and Lichens.

Posters will be available for viewing. Authors will be available to discuss their presentations from 1:00 to 2:00 p.m.

ARSENAULT, MATTHEW A.*, EUSDEN, J. DYKSTRA, and THOMAS, ROBERT J. Bates College. Lichen distribution correlated with rock interaction in an alpine community, Mount Washington, New Hampshire.

BAKER, MARIAN K. and MALONEY, KATHRINA M.* Harris Center for Conservation Education, Hancock, NH. The AIRNET Project: students conducting real research on air quality.

BERGERON, ANGELA L.*, OARD, JAMES, H., WATERS, DEBRA A., and CHAPMAN, RUSSELL L. Louisiana State University. Evidence of Spm/En-like transposons in the embryophytes.

GOLDSMITH, STEVEN J.*, GRIES, CORINNA, and THOMAS, MICHAEL A. Arizona State University. A new technique for photobiont culturing and manipulation.

HILGER, HARTMUT H*, HOFMANN, MARIA, and FREY, WOLFGANG. Institut für Systematische Botanik und Pflanzengeographie, Berlin, Germany. Gametophyte-sporophyte junction in bryophytes: structure and systematic implications.

MATTOCK, TRACEY L.* and VITT, DALE. University of Alberta. The growth of four *Sphagnum* species in axenic culture from spores to mature gametophytes on nutrient agar plates and in liquid culture.

McDERMOTT, J.*, ROGERS, J. and MIAO, V. University of British Columbia, Vancouver. Group I introns in the genus *Thamnia*.

NEWTON, ANGELA E. Smithsonian Institution. Bryophytes from Dominican amber at the Smithsonian Institution

PRIDDLE, D. ROSS. University of Alberta. The rare mosses of Alberta.

SMITH, CLIFFORD W. University of Hawaii. Trouble with grasses.

THOMAS, MICHAEL A.* and NASH III, THOMAS H. Arizona State University. The relationship of water content and PAR to carbon dioxide exchange in the green algal lichen *Coenogonium*.

WATERS, DEBRA*, GOFFINET, BERNARD, VITT, DALE and CHAPMAN, RUSSELL Louisiana State University and University of Alberta. The systematic affinities of the Calomniaceae (Bryopsida) based on 18s nrDNA nucleotide sequences.

WORKSHOP: World Wide Web resources for bryologists and lichenologists. Organized by Brian R. Speer, University of California, Berkeley.

WORKSHOP: Consulting opportunities for bryologists and lichenologists. Organized by Nancy Slack, Russell Sage College, Troy, NY

PANEL DISCUSSION: What can ABLS do for amateur bryologists and lichenologists? Organized by Charis C. Bratt, Santa Barbara Museum of Natural History.

ABLS BUSINESS MEETING

BUSINESS MEETING: Bryological and Lichenological Section, BSA

THURSDAY MORNING, 8 AUGUST

WORKSHOP: Moss in another natural habitat. Organized by MICHAEL L. CHRISTIANSON, University of Kansas. An informal, audience participation, laboratory workshop for beginners, experienced professionals and even those appalled by the idea of working with bryophytes in aseptic culture or other laboratory ways. The final program will depend on what people bring; at the very least, Christianson will bring a bunch of strange-looking mutants of *Funaria* to ponder, and will demonstrate selections for

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ABLS meeting*Continued from page 5*

biochemically-defined mutants, sending you home with plates of your own favorite moss mutagenized and put under selection if you bring spores to Seattle with you.

Brent D. Mishler, Director, University and Jepson Herbaria, 1001 Valley Life Sciences, Associate Professor, Building # 2465, Dept. of Integrative Biology, University of California, Berkeley, CA 94720-2465, phone: (510) 642-6810, FAX: (510) 643-5390, E-mail: bmishler@garnet.berkeley.edu

BLOMQUIST BRYOLOGICAL FORAY

September 13-15, 1996

The 1996 Blomquist Foray will be held in Highlands, North Carolina, September 13-15, 1996, at the Highlands Camp and Conference Center, Highlands, North Carolina. The place is more popularly known as "The Mountain," and is located four miles southwest of Highlands, on NC106, on the top of Scaly Mountain, on the Blue Ridge Divide, with a splendid view.

The accommodations are first-rate, the prices are reasonable, and include lodging for two nights, social hour (beer and wine) and dinner Friday and Saturday nights, bag lunches Saturday and Sunday. The package prices are as follows (per person):

Lodge \$135

Cabin, private bath \$125 (4 people per cabin)

Cabin, shared bath \$115

Rustic bunkhouse \$105

We plan to spend the entire day Saturday collecting (they will pack us a lunch) and a half day on Sunday (also a packed lunch). The collecting should be good for both bryophytes and lichens. Jon Shaw will be in residence and he will be helping.

To receive a registration form for The Mountain, please send your name and address via e-mail DIRECTLY to Lewis Anderson at leanders@acpub.duke.edu.

Molly McMullen, Curatorial Associate, Department of Botany, Box 90342,

IVth Australasian Bryophyte Workshop 1996 June 30th - July 5th

Department of Botany, The University of Queensland, Brisbane, Australia

PROGRAM

The IV Australasian Bryophyte workshop will be held in southeast Queensland. This week will provide an opportunity to explore two very different subtropical Australian environments. Two field trips will be undertaken, both in World Heritage areas. Two days of seminar and laboratory work are also planned and microscopes and laboratory facilities will be available.

1. Field trip 1 (1st-2nd July). A two day trip to Lamington National Park, (2hrs south of Brisbane) to explore a number of different types of bryophyte-rich rainforests on deep, volcanic soils. The rainforest are delimited by altitude and include *Nothofagus moorei* forests and mixed forests featuring *Araucaria cunninghamii*, *Orates excelsa* and *Acmena ingens*. A highlight of the trip will be a canopy walk at O'Reilly's allowing you to explore the canopy epiphytes at close range in safety.

Accommodation on the 1st July will be at Cedar Lake Country Club

2. Meeting (3rd -4th July) Seminars to be held at the Department of Botany, The University of Queensland, St Lucia, Brisbane. Microscopes and other laboratory facilities will be available.

3. Field trip 2a (5th-6th July). A two day 4WD fieldtrip to Fraser Island (3hrs north of Brisbane). Fraser Island is the largest sand island in the world and possess a diverse range of vegetation from rainforests and Eucalypt forests to heathlands, and magnificent landforms including perched lakes, coloured sands and moving sand dunes. Although relatively unexplored bryologically we anticipate the island to be species poor, but very exciting.

Duke University, Durham NC 27708-0342, mmcm@acpub.duke.edu, (919) 684-3603

Accommodation on the 5th July will be at Kingfisher Bay Wilderness Lodge.

Field Trip 2b -Alternative (5th July). A one day alternative field-trip in the vicinity of Brisbane will be run for people wishing less energetic field work.

Registration (\$AU)

Workshop (1- 5 July) \$100

Other expenses - accommodation & meals

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Degrees

Yelitza León, from the Botany Dept., University of Mérida, Venezuela, has obtained a masters degree from the University of Iowa. Under the supervision of Diana Horton, she prepared a revision of the northern Andean species of the genus *Cryphaea*. Under a cooperative effort between the botanical institutes of the universities of Mérida and Bonn (Germany), she has begun work on a study of the diversity of epiphytic bryophytes in the canopy of the tropical forest "La Carbonera", Venezuela, for a PhD from the university of Bonn. In this study area, the diversity of vascular plant epiphytes in the canopy is being studied by a student from Bonn university using climbing techniques. Yelitza León will carry out the same studies on bryophytes. The project will cover studies on the microclimate of this habitat, and, especially, highlight the differences between vascular plants and bryophytes in terms of life strategies, propagation biology, diversity in different parts of a tree and between various trees of a stand.

New publications

Bisang, I. & Urmi, E. (eds.) 1995. *Conservation of bryophytes in Europe. Means and measures. Cryptogamica Helvetica* 18: 1-193. ISBN 3-7150-0031-5. Distributed by: KRYPTO, F. Flück-Wirth, CH-9053 Teufen AR, Switzerland (Fax: +41-71-3331664). Price: SFr. 70.- + postage and package.

The second symposium on the *Conservation of bryophytes in Europe* was held in Zürich, Switzerland, 5-8 September 1994. The symposium volume is divided according to three main themes: the scientific basis for bryophyte conservation, the practice of bryophyte conservation, and the realisation of conservation plans. The second and third themes may sound similar, but the second deals with practical problems in nature whereas the third deals with problems related to human behaviour and legislation. Editing and printing quality is generally high, except that the seas on the maps on page 20 are badly reproduced. The fifteen or sixteen months between the symposium and the appearance of the symposium volume is also a quite reasonable time period considering the amount of editorial work necessary.

The papers of the part dealing with the scientific basis of bryophyte conservation can be divided into three categories. The first of these includes only one paper, by Lars Söderström, on the input from population ecology and metapopulation dynamics. This is the only paper under this theme that has as its main aim to discuss the kind of basic theoretical questions that are still addressed far too little in bryophyte (and other) conservation work. Especially elucidating is the discussion of what "rarity" and the categories used for red lists actually mean, and I believe that many persons applying red lists in conservation work need to consider this more thoroughly than is often done at present. The second category of papers includes overviews and studies aiming at evaluating the threat status for bryophytes and bryophyte habitats in different parts of Europe.

Here we find a paper by Manuela Sim-Sim, Francisco Rego and Jorge de Sousa on bryophyte communities on *Olea europaea* in Portugal, a survey of bryophyte-rich habitats on the island of Terceira in the Azores by Rosalina Gabriel and Cecília Sérgio, a preliminary list of rare liverworts in the Russian Arctic by Alexey D. Potemkin and Nadezhda A. Konstantinova, an overview of the red-listed bryophytes in the Iberian Peninsula by Cecília Sérgio, Montserrat Brugués and Rosa M. Cros, and an analysis by Henrik Weibull and Lars Söderström of how frequent liverworts which are red-listed in Sweden and Norway are in other parts of the world. The last category placed under this theme consists of papers addressing more specific problems and includes a paper suggesting that sporophyte abnormalities may be the cause for the decline of mosses in polluted areas, by Tatyana N. Otnyukova, two papers dealing with the toxicity of certain chemicals to selected bryophytes, by Krzysztof Kolon and Jan Sarosiek, and Piotr Kosiba and Jan Sarosiek, respectively, an analysis of how pollution affects bryophytes along the Danube in Hungary, by Beáta Papp and Miklós Rajczy, and a paper dealing with the role of diaspore banks for the maintenance of hornwort populations in cultivated fields, by Irene Bisang.

Under the title "The practice of bryophyte conservation" we find five papers dealing with the implementation of conservation measures for bryophytes. The first paper, by Tomas Hallingbäck, gives an overview of possible bryophyte conservation measures. Here, I find it a little strange that more locally based red lists are said to be more useful than lists based on a more global perspective. A more global perspective is certainly necessary if we want to put the local flora in a scientifically more correct perspective, and some aspects of this problem were also discussed in the paper by Henrik Weibull and Lars Söderström in the symposium volume. The next paper deals with measures for bryophyte protection in the Tatra mountains by Rudolf Šoltés, and then follows

a paper on the bryophyte site register for Britain by Nick Hodgetts and Gavin Stark. The bryophyte site register should be used for evaluating which sites are most important for bryophyte conservation in Britain. At present, most bryophytes in protected sites are there only by chance. A strange conclusion in this paper is that threatened species are considered good indicators of "bryophyte-rich" Atlantic woods despite the fact that almost 90% of the localities of this kind would be missed by these indicators. To me, species that would identify only twelve percent of the localities they are supposed to indicate are rather poor indicators. The two last papers, by Helen Haab and Leiti Kannukene, and Patricia Geissler respectively, deal with a bryophyte-rich Estonian reserve that was set aside for several reasons, besides the biological qualities of the area, and with two case studies of bryophyte conservation at the site and species level in southern Europe.

The last theme of the Zürich symposium, dealing more with general human behaviour than with nature, is perhaps a bit unconventional and may at first seem a bit out of place. However, this part is probably more important than many of us really would like to recognise. The general public is unlikely to see what we see as specialists, unless we are able to tell them in a way that is understandable without our specialized background. The first paper here, by Hans-Joachim Mosler from the Department of Psychology at the University of Zürich, deals with the psychological foundations for interventions to protect bryophytes (and other organisms as well, I suppose). The paper discusses which parts of human behaviour should be considered in this context, and how attitudes in general can be changed in a way that increase the willingness of people to participate in or support the necessary conservation work. The second paper, by the lawyers Marie Pilch-Giering and Peter Giering, deals with the legal aspects of conservation. We are reminded that law is basically anthropocentric, and bryophytes are certainly hardly considered in the

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Why not Support Bryology by Joining a Regional Society?

REGIONAL BRYOLOGICAL SOCIETIES

American Bryological and Lichenological Society: Dues to the society are \$10 per year. Student dues are \$5 per year. Subscription to "The Bryologist" is \$30 US per year and subscription to "Evansia" is \$5 per year. Payment should be made to Robert Thomas, Department of Biology, Bates College, Lewiston, ME 04240, U.S.A.

Australian Bryological Group. An informal association of bryologists. No dues charged. "The Australasian Bryological Newsletter" is published twice yearly. Donations to cover cost and postage are accepted but not essential. Bryological contributions welcomed. Editor, P.J. Dalton, Plant Science Department, University of Tasmania, G.P.O. Box 252C Hobart, Tasmania 7001, Australia.

British Bryological Society: Dues to the society are £15.00 for Ordinary Members, £1.00 for Family Members (who do not receive the Journal) and £7.50 for Junior Members. Members receive "The Journal of Bryology" and The Bulletin. Applications for membership should be addressed to A. V. Smith, Membership Society, 1 Carr Meadow Cottages, Glossop Road, Little Hayfield, via Stockport, Cheshire, SK12 5NR, U.K.

Bryological and Lichenological Section of the Czech Botanical Society: Dues are 40, - Czech crowns per year; for members of Czech Botanical Society dues are 20, - Czech crowns per year; subscription to "Bryonora" is included; payable to Hana Franklová, National Museum, Department of Botany, CZ-252 43 Průhonice, Czech Republic.

Bryological Society of Japan: Dues are 3,000 Japanese yen per year; includes subscription to the Proceedings of the Bryological Society of Japan; payable to Dr. Satoshi Imura, National Institute of Polar Research, 9-10 Kaga 1-chome, Itabashi-ku, Tokyo 173, Japan.

Bryologisch-Lichenologische Arbeitsgemeinschaft für Mitteleuropa: Dues are DM 35 per year; includes subscription to Herzogia; for subscription

of each of the newsletters "Aktuelle Lichenologische Mitteilungen" and "Bryologische Mitteilungen" add DM 10; payable to John Volker, Pfalz-museum Für Naturkunde, Hermann-Schäferstrasse 17, D-67098 Bad Dürkheim, Germany.

Dutch Bryological and Lichenological Society: Dues are NLG 25 per year; includes "Buxbaumiella"; payable to Bart F. van Tooren, Venuslaan 2, NL-3721 VG Bilthoven, The Netherlands.

Nordic Bryological Society: Dues to the society are 285 NOK including "Lindbergia" (205 NOK for students) and 65 NOK without "Lindbergia". Payment c/o Söderström must be in Norwegian Kroner (or in the currency of the issuing banks country); checks in any other currency will be returned. If you pay with check, please add NOK 35. Payment may be made in US or Canadian (X 1.39 US) currency to Dale Vitt, Department of Biological Sciences, University of Alberta, Edmonton, AB T6G 2E9, Canada. Payment in US dollars is \$42.75 (285 NOK); \$32.75 (205 NOK); and \$9.75 (65 NOK). Payment in NOK is made to Nordic Bryological Society, c/o Lars Söderström, Department of Botany, University of Trondheim, N-7055 Dragvoll, Norway.

Schweizerische Vereinigung für Bryologie und Lichenologie/Association suisse de bryologie et de lichénologie: Dues are sfr. 20 per year; members receive the newsletter Meylania twice a year; application either to the president, Philippe Clerc or the secretary, Patricia Geissler, both at Conservatoire botanique, Case postale 60, CH-1292 Chambésy, Switzerland; e-mail: clerc or geissler@cjb.unige.ch.

Sociedad Latinoamericana de Briología: Dues are US\$ 10.00 per year; members receive three issues of BRIO-LATINA, the newsletter of the society; payable to Noris Salazar, Smithsonian Tropical Research Institute, Apartado 2072, Balboa, Republica de Panama; Fax (507) 232-5978; e-mail stritivoli.salazarn@ic.si.edu.; or to Maria Isabel

Morales, Escuela de Biología, Ciudad Universitaria "Rodrigo Facio", San Jose, Costa Rica.

(To be continued) ... further responses for additional societies - please contact Dale H. Vitt at Department of Biological Sciences, University of Alberta, Edmonton, AB T6G 2E9, Canada or e-mail dvitt@gpu.srv.ualberta.ca

New publications

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Swiss and German legislation, used as examples. The last paper, by Geert Raeymaekers, deals with bryophyte conservation in the European Union (EU). This is basically an overview of the legal and financial possibilities for conservation measures within the EU, and because many European countries are nowadays members of this union, this information is essential for successful measures in many cases.

The present volume brings us up-to-date with happenings in European bryophyte conservation. Although there is a lot of high quality research going on in this important field, many authors also point out how much still remains to be done and how urgent this is. We still need a lot more basic information on how common many species are, and we need even more information on the biology and habitat preferences of different species. Still, after having read the symposium volumes from the Uppsala symposium in 1990 and the Zürich symposium in 1994, I am left with a feeling that some even more fundamental aspects have scantily been treated yet. One thing that I personally think should be more fully considered among bryophyte conservation researchers and administrators is the basic assessment of which species or habitats should be given priority in conservation work. From an earlier state when beautiful or spectacular species or habitats were considered for conservation measures, we have now reached a state where the most important measure of conservation priority seems to be rarity and risk for extinction, the latter mostly

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New publications

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 at a national level. We should, however, remember that a red list is basically only a status report (for a given area), not a priority list for conservation actions. There are several other factors that must be considered if our efforts should become as efficient as possible on the global scale, which is probably the biologically more sound scale in this business even if the conservation actions may have to be taken by different nations. Besides the fact that we should aim at more global approaches in evaluating which species or habitats should be given the highest priorities for conservation, at the species level we must, for example, also start to evaluate the possibilities for including components such as phylogenetic representativeness in practice and not only in theory. If we have no clear guidelines for which species and habitats require most urgent preservation, much effort on evaluating the present status of these, or on evaluating their biology or habitat, will certainly be sub-optimal. Let us hope that coming symposia on endangered bryophytes, in Europe and other areas, will consider these kinds of basic questions more fully. [L.H.]

Schnyder, N. 1993. Vorprojekt zur Erfassung von Indikator-Moosen in den Objekten der Bundesinventare der Hoch- und Flachmoore von nationaler Bedeutung. Forschungsstelle für Umweltbeobachtung, Egg, pp. 1-65, + 47 pages of appendixes. ISBN number lacking. Available from: Forschungsstelle für Umweltbeobachtung, Forchstrasse 100, CH-8132 Egg/ZH, Switzerland (Fax: +41-1-9843969). Price: Unknown.

This is a report from a project aiming at deciding which bryophytes can be used as indicators for different environmental parameters in mires in Switzerland. In order to assess mire characteristics such as nutrient status, light condition, acidity, wetness, temperature conditions, and general human influence, 94 potentially useful bryophytes were selected. These species were then referred to different categories based on literature information about their habitat de-

DIARY

Continued

the Warden, Dr. R. Lucas.

August 17-24. BBS summer field meeting in Braemar, Kincardine & Deeside, Scotland. Local Secretary: Dr. Noel Pritchard, Foresters' Cottage, Durriss, Kincardine, AB31 3BD. Tel.: 01330 811215.

August 21-25. Field work at Champex, Valais (Central Alps). Information: P. Geissler, Conservatoire et jardin botaniques, C. P. 60, CH-1292 Chambésy/Genève. FAX 41-22-738 45 97. email: geissler@cjb.unige.ch

August 27-29. The Linnean Society of London is holding a conference in Belfast, Northern Ireland on 'Systematics and Biological Collectors'. Further information from Cathrine R. Tyrie, Department of Botany, Ulster Museum, Belfast BT9 5AB, N. Ireland. Phone 01232 381251. Email: crt@belumreg.demon.co.uk.

September 1-6. Course: "Woodland Bryophytes". Tutor: Dr. Martha Newton, Rhyd-y-creuau, Drapers' Field Centre, Bets-y-coed, Gwynedd, LL24 OHB. Offering individual guidance at all levels. Details from the Warden, Mr. K. Iball.

September 7-17. Bryophyte course: "Mosses and Liverworts". Tutor: Dr. Martha Newton, Kindrogan Field Centre, Enochdhu, Blarigowrie, Perthshire, PH10 7PG. Offering individual guidance at all levels. Details from the Warden, Dr. A. Gimingham.

September 20-21. Dutch Bryological and Lichenological Society field meeting on the island of Schiermonnikoog. Contact person: L. Spier, Kon. Arthurpad 8, 3813 HD Amersfoort, the Netherlands.

October 20-22. BBS Annual General Meeting and Symposium Meeting at Ness Botanic Garden, Wirral. Local Secretary: Dr. Hugh McAllister, Ness Botanic Gardens, The University of Liverpool, Environmental & Horticultural Research Station, Ness, Neston, Wirral, Cheshire, L64 4AY. Tel.: 0151 3530123.

October 8-12. International Symposium of Botanic Systematics and Plant Geography, Herbarium Haussmecht, Jena, Germany.

October 14-17. The ninth Bryological-lichenological meeting of the Czech bryologists in Jihlava town. Send the applications to RNDr. Ivan Novotny, Department of Botany, Moravian Muzeum, Preslova 1, CZ-602 00 Brno, Czech Republic. E-mail mzm@mzm.anet.cz.

1997

May 26-30. IAB meeting in Beijing, China. Topic: "2000's Bryology. Followed by two excursions, one to SE China and one to NW China. The first circular will be ready in mid 1996. Contact person: Prof. P. C. Wu, Inst. of Botany, Academia Sinica, Xian shan, 100093 Beijing, China. Fax: 0086-010-8319534.

mands. Then they were tested on a selection of 43 representative mires (out of 1500 mires of some importance in Switzerland), and based on this investigation the number of species considered useful decreased to sixty. However, the author believes that this number may decrease somewhat further as more data accumulate. The species useful as indicators in bogs and fens are kept separate, and are divided into groups indicating richness or

poorness in nutrients, calcium-richness (only fens), acidity (only fens), shade, wetness, dryness, warmth, cold, disturbance, stagnation (only bogs), and influence of grazing. The idea is that with these indicators, a rather complete idea about the habitat conditions in a mire can be gained with a relatively moderate investment of time. The report ends with estimates of the time and costs for an inventory of 450 mires using these indicator species. [L.H.]

The Bryological Times is a newsletter published bimonthly for the *International Association of Bryologists*. Items for publication are to be sent to the Editors (preferably HW), **except** for those for the regular columns, which may go **direct** to the column editors.

Deadlines for material to the Bryol. Times will be January 15, March 15, May 15, July 15, September 15 and November 15 with the publication shortly afterwards. Shorter notes may be accepted later if there is still space.

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Column Editors

J.-P. Frahm & B. O'Shea (computer techniques); J. M. Glime (ecology); T. Hallingbäck & E. Urmi (conservation); A. R. Perry (news from the herbaria); T. Pócs (tropical bryology); M. L. Sargent (techniques); J. Vána & W. R. Buck (floristics and phytogeography); D. H. Vitt (best book buys, taxonomy).

The Bryological Times, founded in 1980 by Stanley Wilson Greene (1928-1989), is distributed from Beijing (China), Canberra (Australia), Edmonton (Canada), Eger (Hungary), Geneva (Switzerland), Hiroshima (Japan), Moscow (Russia), Praha (Czech Republic), St. Louis (USA) and Trondheim (Norway).

Production

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For details regarding membership of to *International Association of Bryologists* (currently US \$ 11.- per year) write to Dale H. Vitt, Department of Botany, University of Alberta, Edmonton, Alberta, Canada T6G 2E9.

DIARY

1996

July 11-13. Second International *Sphagnum* Field Trip and Symposium in New Jersey, New York and Quebec. Further information from Dr. Line Rochefort, Phytologie, FSAA, Université Laval, Québec, Canada, G1K 7P4, fax (418) 656-7856 or e-mail LROC@vm1.ulaval.ca.

July 13-14. 4th Annual Canadian Peatland Restoration Workshop at Université Laval, Québec, Canada. Further information from Dr. Line Rochefort.

July 21-31. Dutch Bryological and Lichenological Society field meeting in Devonshire, England. Contact person: L. Spier, Kon. Arthurpad 8, 3813 HD Amersfoort, the Netherlands.

July 25-28. International Symp. of Plant Character and Diversity of East Asia. Kunming Institute of Botany, Academia Sinica, Kunming 650204, China

July 26-August 2. Course on "Mosses and Liverworts". Tutor: Dr. Martha Newton, Malham Tarn Field Centre, Settle, North Yorkshire, BD24 9PU. Offering individual guidance at all levels. Details from the Warden, Mr. K. Iball.

July 31 - August 5. Summer excursion and annual assembly of the Bryologisch-Lichenologische Arbeitsgemeinschaft für Mitteleuropa: Stubai Alpen (Tyrol, Austria). Further information: Paul Hofmann, Unterer Stadtplatz 8a, A-6060 Hall in Tirol.

August 1-2. Workshop on Conservation of Bryophytes in Europe, at Reading, U.K. Topics: 1) Revisions of Red Data Books of Europe and the application of the new IUCN categories. 2) Floristic investigations of Europe: the status of knowledge and identification of areas where more work is needed. Enquires and pre-registration to Royce E. Longton, Department of Botany, University of Reading, Whiteknights, RG6 6AS Reading, U.K. Fax. +44 1 734 753 676.

August 2-4. ABLS Foray. Field trip on the Olympic Peninsula and central Cascades. For more information please contact: Katie Glew, Botany Dept. Univ. of Washington, e-mail: kglew@u.washington.edu phone: 206-685-2428 (lab), 206-725-0433 (home) fax: 206-684-1728 or Judy Harpel, Botany Dept. Univ. of British Columbia, e-mail: harpel@clark.edu phone: 604-822-3344 (lab), 360-254-6671 (home and work)

August 4-8. ABLS meeting in conjunction with the Bryological Section of BSA at the AIBS meeting in Seattle, Washington. Further information from Brent Mishler, University and Jepson Herbaria, 1001 Valley Life Science Building, Univ of California, Berkely, CA 94720-2465.

August 5-8. To celebrate the 100th anniversary of the British Bryological Society, a symposium entitled 'Innovations in bryophyte research' will be taking place at the University of Glasgow. Contributions are being invited. Local Secretary: Dr J.H. Dickson, Department of Botany, The University, Glasgow, G12 8QQ. Tel.: 0141 339 8855, Fax: 0141 330 4447.

August 9-16. Bryophyte course: "Mosses and Liverworts". Tutor: Dr. Martha Newton, Preston Montford Field Centre, Montford Bridge, Schrewsbury, SY4 1DX. Offering individual guidance at all levels. Details from the Warden, Ms. S. Townsend.

August 10-17. The BBS summer field meeting in Ballachulish, Argyll, Scotland. Local Secretary: Gordon Rothero, Stronlonag, Glenmassan, by Dunoon, Argyll, PA23 8RA. Tel.: 01369 706281

August 16-23. Bryophyte course: "Mosses and Liverworts of the Lake District". Tutor: Dr. Martha Newton, Blencathra Field Centre, Threlkeld, Keswick, Cumbria, CA12 4BR.. Offering individual guidance at all levels. Details from