The Bryological Times
September 1981, Number 11
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THE BRYOLOGICAL TIMES

Newsletter of the International Association of Bryologists

September, 1981 No. 11

CONTROL OF MICROENVIRONMENTAL RELATIVE HUMIDITY

by Richard H. Zander

THE ARTICLES ON bryophyte cultivation by Mr. B. G. Bell (Bryol. Times 2:1-2) and Dr. H. Inoue (Bryol. Times 7:6) prompted me to provide an account of a solution to the problem of controlling the level of atmospheric moisture in small growth chambers. I have attempted to cultivate polymorphic taxa of Pottiaceae under atmospheres of different relative humidities and rates of drying to test for any sharp response in morphology to these stresses. Commercially available growth chambers with humidity control may not be appropriate for microenvironmental study and are costly. I experimented with chemical solutions that have been used in the past to dry air to certain degrees of relative humidity. The chemicals were very slow in extracting moisture from air when they were introduced into cultivation chambers in shallow dishes, and I now am rather sceptical about results of studies that simply cite, without direct measurement, relative humidities in cultivation chambers (supposedly controlled with various chemical solutions) as values from listings in chemical tables.

Exchange was greatly hastened by forcing air to pass over chemical drying solutions (not bubbling, as this introduces particles of solution into the air), then piping atmospheres of particular RH's into cultivation chambers. By balancing the rate of flow of the introduced air of low RH against the moisture (if any) contributed to the chamber atmosphere by the plant and substrate, a final RH may be determined (by direct measurement) for the chamber. In practice, the technique was only partially successful because the chemical array needed too much maintenance for a long-term study without staff support. It was feared that chemicals used for drying would eventually contaminate the experiment. One may also note that lithium chloride is said to be carcinogenic, calcium chloride solution hardens into a rock-like lump when dehydrated and then breaks flasks through expansion, and sulphric acid is a chemical devil with faults familiar to everyone. The problem was solved by dispensing with chemical driers altogether and merely refrigerating piped air, catching the condensate in a trap, warming the dried air and then piping it to cultivation chambers.

The following equipment and sequence of treatments of air piped through laboratory tubing details a successful way of providing inexpensively matched cultivation chambers with two streams of air of similar quality but differing in relative humidity. 1. Air pump (aquarium model used at BUF). 2. Flow regulator (an exhaust valve). 3. Activated carbon filter. 4. Glass wool particulate filter. 5. Sodium bicarbonate trap, (2 flasks in series containing saturated solutions of $NaHCO_3$, which traps atmospheric sulphur dioxide and acids with the air passing over the surface of the solution, not through it). 6. Flask with aquarium "bubbler stone" (to saturate completely the air by bubbling it through water). 7. Refrigerated moisture trap (tubing enters and exits refrigerator through hole drilled above the 500-ml flask that acts as a condensate trap). 8. Air warmer (excurrent air warmed to room temperature by passing through glass tubing immersed in a water-filled flask). 9. T-tube (air flow divided). 10A. Empty flask, then air piped into "dry" cultivation chamber. 10B. Humidifier (air passes from T-tube into flask half-filled with water, then into "moist" cultivation chamber.

To ensure equal or nearly equal flow rates in both chambers, similar frictional barriers to flow should be provided after the T-tube air flow division. After the T-tube division of the air flow, even a small drop of condensate can completely block the air flow to the "moist" chamber. At BUF, the arrangement described above produces two pre-chamber air streams of fairly constant relative humidity--

31-35% RH from "dry" line and 80-89% RH from "moist" line, with refrigerator at 5°C and room temperature varying between 20.5 and 23.0°C. Duplicate growth chambers of clear plastic boxes of shoebox size each provided with an air inlet and an exhaust nozzle, and each with several small, moist, open culture vessels, can be kept between 83 and 90% RH and 96 and 100% RH, "dry" and "moist", respectively, at the rather low air flow rate of an aquarium air pump working under the rather considerable load detailed above. Direct measurement of RH is essential, and I recommend hygrometers manufactured by Brooklyn Thermometer Co., Farmingdale, NY 11735 USA (sold by Markson Science Inc., 2215 Brownsville Road, Pittsburgh, PA 15210 USA--their order number T-17000); these are relatively inexpensive, accurate, small (10 cm wide dial face), extraordinarily fast in response time, and easy to recalibrate.

Clinton Herbarium, Buffalo Museum of Science, Buffalo, NY 14211 USA.

INTERNATIONAL RESEARCH PROGRAMME ON BRYOPHYTE CHEMOSYSTEMATICS

by C. Suire

To date more than 200 bryophyte species have been chemically investigated, many being found to be of taxonomic interest. Unfortunately, existing data are difficult to correlate because they have not all been obtained from the same species or the same population. This new programme has been started to promote bryophyte chemosystematics by - improving the correlation between chemical and biosystematic data; - co-ordinating the analysis of uncommon species or species of questionable systematic position.

Participants

Initiated by C. Suire, this programme has so far received the agreement of the following people to participate provisionally as follows:

+ Chemosystematics

Aromatics (except for flavonoids) and terpenoids: Professor Y. Asakawa and colleagues (Tokushima, Japan).

Monoterpenes in liverworts; triterpenoids and sterols in bryophytes. C. Suire and Y. Asakawa.

Flavonoids
from Marchantiales: Dr. K.R. Markham (Petone, New Zealand).
from Metzgeriales: Prof. H.D. Zinsmeister (Germany).

Isoenzymes: Dr. M. Krzakowa (Poznań, Poland).

+ Biosystematics

Biometry and genetics of liverworts, especially Marchantiales: Dr. H. Bischler (Paris).

Ultrastructure of the spermatids of liverworts and fine morphological study of the gametophyte: Dr. C. Suire (Bordeaux).

In addition, several well known bryologists have agreed to collect adequate samples or identify collected material.

Working procedures

All participants are invited to collect adequate material of any bryophyte species to allow at least two kinds of analysis, all specimens being sent, in the first instance, to the co-ordinator. A small part of each sample will be deposited in the herbarium of a museum and where necessary the co-ordinator will send a part of the sample to an authority for identification. The remainder will be divided as appropriate and sent for analysis to participants.

Role of co-ordinator

C. Suire, as co-ordinator, will:

- collect, or try to obtain from willing bryologists, adequate samples of interesting species and arrange for identification as necessary.
- supply participants with samples as detailed above.
- centralise data and reprints (supplied by participants) on the chemistry and chemosystematics of bryophytes.
- supply copies of previous results or of a paper where a participant cannot obtain it in the ussual way.
- summarize results each year in an annual report which is sent to all participants. A summary of this report will be published in The Bryological Times. The first report could be ready by 1st December, 1981.

Publications

All results belong to individual re-

search workers who are free to publish anywhere and in any way they choose. Participants who have been supplied with material are asked to quote the name of the collector and/or identifier as appropriate and to mention that some or all of the published report is a part of the International Joint Research Programme on Bryophyte Chemosystematics. They are also asked to deposit with the co-ordinator a copy of the manuscript when it has been accepted for publication and, later, reprints of the paper.

Size of samples

Biosystematic and isoenzyme investigations require freshly collected material kept moist and in good condition.

Other chemical analysis can be performed from material dried in the shade at room temperature (oven drying at $> 30^{\circ}C$ is not recommended).

While some chemical analysis can be performed on as little as 10gm dry weight of clean dried material, isolation of particular compounds may require as much as 200 gm dry weight of clean dried material or close to 2 Kg of moist washed material.

Joining project

All bryologists interested in participating in this project whether as investigators, identifiers of material or collectors, are invited to write to the co-ordinator, C. Suire at:

Laboratoire de Botanique, Université de Bordeaux, 33405 Talence France.

Elaters: spiral or helicoidal bands, sinistrorse or dextrorse?

by G. G. Hässel de Menéndez

Some terms have been unambiguous in their meaning from the first time they were used. But in other cases precision has only been reached after agreement between scientists. The terms used to describe the bands of elaters are examples of some that may need reconsideration.

Recent comments by Dr. Kuwahara on drawing techniques (Bryol. Times 8:5, 1981) drew my attention to the torsion of the so called "spiral" bands of hepatic elaters. Emphasis is given, in general, to the length, width, shape of tips, number of bands, etc. but the nature of the torsion is, on the whole, not mentioned.

In geometric terms the bands, when not annular but forming a continuous figure along the walls, describe a helicoidal line. Strictly speaking, a helix is a curve of indefinite length, which runs along the surface of a straight cylinder while a spira is a curve which twists indefinitely around one point constantly getting further from it. Thus the bands of elaters are really helicoidal.

Looking at Dr. Kitagawa's paper (Miscnea bryol. lichen. 8(9) : 188-190, 1980) which was mentioned by Dr. Kuwahara, a very familiar image came to mind, which reminded me of an earlier well illustrated but often overlooked article by Dr. B. Siessegger (Die Elateren der Lebermoose, ihr Bau und die taxonomische Verwendbarkeit, Dissertation ..... Eberhardt Karls Univ. TÜbingen,1-87, 19pl. 1966).

Helicoidal figures, like the bands of elaters, are commonly developed by the stems of twining plants. The direction can be either dextrorse (dextrorsum = towards the right side) i.e. clockwise or sinistrorse (sinistrorsum = towards the left side) i.e. anticlockwise. The description of "dextrorse" and "sinistrorse" is not similar in various botanical dictionaries and leads to erroneous conclusions, since it is often not made clear if the figure is being viewed from the outside, from above or from the inside. There is no space here to transcribe all of them.

One work, which I have to hand : Font Quer, P. 1963, Diccionario de Botanica, publicada con la collaboracion de eminentes especialistas. Barcelona, Edit. Labor. S.A. I-XXXVI, 1-1244 (In Spanish) explains these figures very well. On p. 320 Font Quer indicates: "..... that it has been agreed, in relation to the torsion of twining stems, that they have to be observed from above their apices". Dextrorse = clockwise. Plants twining dextrorsum is illustrated by *Lonicera japonica*. On p. 1002 one finds sinistrorse = anticlockwise, which is also to be observed from above the apex. Plants twining sinistrorsum is illustrated by *Convolvulus althaeoides*.

This same method of interpretation has also been used by Saito (J. Hattori bot. Lab. 39: 496, fig. 47,17 & 32, 1975), although not specific -

ally mentioned by him when he described and illustrated the torsion of the peristome of *Barbula arcuata* Griff. and all the other twisted peristomes in the same article.

Using these concepts, as described by Font Quer, all elaters illustrated by Kitagawa and by Siessegger have dextrorse helicoidal bands, except those that are annular.

I propose that for all examples of torsion in bryophytes the direction is established by looking at the object from above the apex or ends.

Museo Argentino de Ciencias Naturales "Bernardino Rivadavia", Avda Angel Gallardo 470, C.C. 220, 1405 Buenos Aires, República Argentina.

Birthday 'Special' for Geneva Sayre

ON JUNE 12, 1981 the Farlow Herbarium celebrated the 70th birthday of Geneva Sayre. A reception, banquet, and presentation of a special volume of the Occasional Papers of the Farlow Herbarium marked the occasion. Friends and associates representing the many facets of Geneva Sayre's career attended.

Geneva was both pleased and completely surprised, though the volume dedicated to her had been edited in the Farlow mostly during her usual time spent working there; also everyone in daily contact with her and many of her correspondents had known of the plans months if not years in advance.

Organizing the affair drew upon the talents (some of a rather underhanded nature) of the Farlow staff; it appeared that it was going to be difficult to get Geneva to come to her own "surprise" party as she was very much interested in attending a local historical tour the same day. A somewhat elaborate scheme, well-laced with intrigue and involving the cooperation of friends outside the Farlow, was devised. The morning of the party, Geneva, on mentioning the fact that she was about to leave for her usual work day at the Farlow, was calmly informed "Oh no, you're not. You are going to work at Widener Library" in a tone that would tolerate no argument. (This was to give the staff a free hand in preparing the building for the 3p.m. reception.) Continuing in the same vein, Geneva was asked what she was planning to wear that afternoon to the expected small-scale Farlow birthday party (which was traditionally "come-as-you-are"). "My work clothes", she said, puzzled by the question. Persuaded at last to don somewhat more festal raiment, Geneva arrived at the Farlow at the appointed time and festivities began. It is a tribute to Geneva's unsuspecting nature that clues dropped inadvertently up to the day of the party were not retained and puzzled over. Dr. Sayre's reaction still is one of incredulity that the celebration occurred and she knew nothing of it beforehand.

Among the visitors who travelled from the American Bryological and Lichenological Society meetings in North Carolina were W. C. Steere and his wife, Gert Mogenson who was travelling with the Steere's and Nancy Slack who represented Russell Sage College. With the help of Mrs. Anna Reid, they made a close airlines connection and arrived in time.

A Geneva Sayre Fund has been established at the Farlow Herbarium by Geneva's friends. The fund which now has a balance of over $4,000 has been designated by Geneva to support visiting scholars' work at the Farlow Library and Herbarium.

Volume 16 of the Occasional Papers may be purchased from the Farlow Herbarium for US $15. It contains the following papers:

Crum, Howard. An inventory of John Macoun's Canadian Musci.

Culberson, W.L. & Chicita, F. A new *Ramalina* with two new depsides.

Edgar, R.K. The origin of diatom biology in America.

Ewan, J. Who was John Torrey's "Prof." Shelton lost on the Steamboat *Jenny Lind*?

Fulford, Margaret. Some Hepaticae collected by Dr. Roland Thaxter in Chile. 1905 - 1906.

Gradstein, S.Rob and Lucie Terken. Studies on Lejeuneaceae subfam. Ptychanthoideae VI. A revision of *Schiffneriolejeunea* sect. *Saccatae* from Asia.

Greene, S.W. Retrieval works useful to the bryological taxonomist.

Grolle, R. Was ist *Lejeunea Schumannii* Caspary aus dem baltischen Bernstein?

Jovet-Ast, S. *Riccia* d'Amerique tropicale.

Lamy, Denis. Ferdinand François Gabriel Renauld (1837-1910) Sa vie—ses correspondants.
Pfister, D.H. Atkinson, Farlow, and the later starting point debate.
Richards, P.W. Robert Hooke on mosses.
Stafleu, Frans S. An Engler episode.

W. C. Steere, Ruth Z. Temple, Geraldine C. Kaye, and Reed C. Rollins provided introductory material about Geneva Sayre--teacher, scholar, local historian and collector.

Carolyn S. Hesterberg, Farlow Herbarium Harvard University, 20 Divinity Ave., Cambridge, Massachusetts 02138, U.S.A.

Corrections to Directory

THE FOLLOWING NAME CHANGES should be made to the appropriate entries in S.R. Gradstein's Directory of bryologists and bryological research, Ed.2. (Regnum vegetabile, Vol. 99), 1979.

Chile

Change	GODOY, C.P.	to	C. Pisaro G.

China

Change	CHIEN, G.	to	Cao, Ch.
Change	MU, Z.	to	Zang, M.

The editor will be pleased to receive and publish other necessary corrections to keep the Directory as up to date as possible.

BULLETIN of BRYOLOGY

Available as reprint to IAPT members

STARTING WITH BULLETIN No. XXI, which it is expected will appear in an issue of Taxon to be published later this year, one copy/person will be available on a regular basis to all members of IAB who are fully paid up members of IAPT. Up to the present the Bulletin has been received by these members as an integral part of their copy of Taxon. IAPT members of IAB wishing to obtain a copy of the Bulletin in this way as a separate additional to their normal copy of Taxon, should write to the Honorary Gen. Sec., Dr. S.R. Gradstein, at Utrecht (see address on last page of this issue).

Please note that although this new arrangement will be freely available, a copy will only be sent regularly to the members who write and request it.

Bryological activities in Egypt

by W. El-S. El-Saadawi

BRYOPHYTES ARE, unfortunately, the least known group of Egyptian plants. As far as I am aware publications dealing critically with, or only referring to, members of this group of Egyptian plants are in total less than 25 over a period of more than 150 years (1824-1979). The herbaria of the Botany Departments at Cairo and Ain Shams Universities have specimens of about 60 Egyptian bryophyte species which represents almost half the number of species mentioned in the literature as occurring in this country.

A few years ago bryological activities, excursions and morphological studies, started at the Botany Department of Ain Shams University with the aim of producing a moss flora of Egypt. There are very few Egyptian bryologists and they work on mosses. There are no hepaticologists. One postgraduate student is working on possible moss-algae associations. I would be grateful for information about any relevant publication concerning this latter subject.

I started work on Egyptian mosses in 1972 and I have published three papers on this subject, two in Proc. Egypt. Acad. Sci., 25(1972); 26(1973), the last with Wafaa Abou-El-Kheir, and one in Publs. Cairo Univ. Herb. 7 & 8 (1977), jointly with Afaf Badawi. A list of all works - that I am aware of - on Egyptian mosses and hepatics will appear shortly in the Bull. Bryol.

While teaching at Kuwait University, 1974-1978, I had the chance to study the bryoflora of that country and to complete the following four papers:

Some mosses from Kuwait. Bryologist 79: 515-518, 1976 (A short article).

Contribution toward a moss flora of Kuwait. J. Univ. Kuwait (Sci.) 6: 125-152, 1979.

Peculiar aerial rhizoids in some mosses from Kuwait. J. Bryol. 10(4): 575, 1979 (A note).

Observations on drought resistance in some Kuwait desert mosses. (Accepted for publication in Proc. Egypt. Acad. Sci. on 6.iii.1979)

I have given the details of these papers since they are hitherto the only publications on the bryoflora of the State of Kuwait.

For such a small group of workers as ouselves the maintenance of membership in IAB, apart from other reasons, gives us a 'belonging feeling' which helps us to move our activities forward.

Department of Botany, Faculty of Science, Ain Shams University, Cairo, Egypt.

EXCHANGE AND MART

Still available

COPIES OF THE WORKS listed below are still available from the addresses indicated. The prices are all current prices supplied as a result of a recent enquiry: postage is likely to be extra.

It is probable that other works, now rare and ordinarily thought of as only obtainable through antiquarian booksellers, are similarily available. Readers knowing of such works are asked to send details to the Editor indicating how much of the information provided has been recently confirmed.

JØRGENSEN, E. 1934. Norges Levermoser Bergens Mus. Skr., 16: 1-343. Price N.kr. 150.

Orders to Finn Skauge, Librarian, University Library, Møhlenprisbakken, 1, University of Bergen, N-5000 Bergen, Norway.

RENAULD, F. 1897. Prodrome de la Flore bryologique de Madagascar des Mascareignes et des Comores publiés par ordre de S.A.S. Le Prince Albert ler. Imprimerie de Monaco. Price 12 French Fr.

RENAULD, F. 1909. Essai sur Les *Leucoloma* et supplement du Prodrome de la Flore bryologique de Madagascar des Mascareignes et des Comores publiés par ordre de S.A.S. Le Prince Albert ler. Imprimerie de Monaco. Price 16 French Fr.

Copies of the two volumes by F. Renauld are available from the Institut Océanographique, Musée Océanographique, Avenue Saint-Martin, MC-Monaco-Ville, Principauté de Monaco.

SAINSBURY, G.O.K. 1955. Handbook of New Zealand mosses. Bull.R.Soc.N.Z. No. 5., 490pp. Reprinted Nov. 1971. N.Z. $5.00

Orders to The Publications Officer, The Royal Society of New Zealand, P.O. Box 12249, Wellington, N.Z.

Wanted

Buxbaumia Vols. 1 & 2, 1947 - 48.

Megaw, W.R. 1934. *Ulota*, the romance of a moss-hunter. Belfast, Quota Press.

S. W. Greene, Department of Botany, The University, London Road, Reading RG1 5AQ, England.

Prepublication offer

Vogelenzang, L. Ed. Guide to the prices of antiquarian botanical books 1970-1979. Series A. Cryptogamic literature. Due December 1981. c. 530 pp Subscription price: D.fl. 80.- (incl. postage and packing). After publication: D.fl. 95.- (incl. postage and packing).

This work will cover the whole field of Cryptogamy and include:- books, monographs, reprints, periodicals.

Boerhaave Press, P.O. Box 1051, 2303 BB Leiden, Holland.

Personalia

DR. A. ABOLINA, formerly of Riga, has now moved to the Latvian Scientific Forestry Research Institue, 111 Riga Str., Salaspils, Riga Region 229021, Latvian SSR, USSR.

DR. WILLIAM J. HOE, formerly a member of the University of Hawaii, has now moved to the Department of Botany, Bernice P. Bishop Museum, P.O. Box 19000-A, Honolulu, Hawaii 96819, U.S.A.

DR. FRANS VERDOORN celebrated his 75th birthday on 24 July, 1981.

Dr. Ronald A. Pursell has written that

MONTE G. MANUEL died in Nairobi, Kenya on 8 June 1981. He had recently completed a three-year appointment at the University of Malaya in Kuala Lumpur and had just begun a two-year appointment at the University of Nairobi. An account of Monte's career will be published in The Bryologist.

New address for Editor of

The Bryological Times

FROM 1 JULY 1981 the editor ceased to be a member of staff of the Institute of Terrestrial Ecology, having accepted a Readership at the University of Reading. He expects to move from Penicuik about the middle of September 1981.

From 1 October 1981 his new address will be:

Department of Botany,
The University,
London Road,
Reading RG1 5AQ,
England.

All future correspondence relating to The Bryological Times should be sent to the editor at Reading.

BRITISH MUSEUM (NATURAL HISTORY)
Cromwell Road, London SW7 5BD

CENTENARY OPEN DAYS

CELEBRATING 100 YEARS AT SOUTH KENSINGTON IN 1981

18 and 19 Nov. 10.30 - 16.30

Many aspects of the scientific work and supporting library services of one of the world's leading taxonomic institutions will be shown in over 100 exhibits, and staff will be on hand to talk about their research and services.

Tickets for admission will not be issued, but those who wish to attend are asked to inform the 'Open Days Office'.

Recent Publications

Bryologist 83(4), 1980.

Bull. Bryol. No. XX Taxon 30(2): 538-542, 1981.

Bull. Brit. Bryol. Soc., No. 38, July 1981.

Cryptogamie, Bryol. Lichén 2(2), 1981.

J. Bryol. 11(3), 1981.

Miscnea bryol. lichen 9(1), 1981.

Engel, J.J. Index Hepaticarum Supplementum 1976-1977. Taxon 30(2): 518-537, 1981.

Occasional papers of the Farlow Herbarium No. 16. For details of contents see this issue p. 4-5.

DIARY

SECRETARIES OF BRYOLOGICAL SOCIETIES, organizers of symposia, workshops or anyone with knowledge of a meeting or event of interest to bryologists which has not yet taken place, and has not already been noticed in these columns, are asked to send details direct to the Editor of this Newsletter. The more complete and up to date the diary the more useful it will be.

ABLS = American Bryological and Lichenological Society; BBS=British Bryological Society; BLAM=Bryologisch - lichenologische Arbeitsgemeinschaft f. Mitteleuropa; CEBWG=Central and East European Bryologists Working Group; IBC=International Botanical Congress; NBS=Nordic Bryological Society; SBLS=Swiss Bryological and Lichenological Society. Rd=Revised date i.e. different from that published previously.

1981

5-10 Sept. BLAM. Excursion to Lungan Salzburgerland, Osterreich. See Bryol. Times 10:12.

11-18 Sept. Preston Montford, England Bryophyte field course. Tutor Dr. Martha Newton. For further particulars and registration write to Preston Montford Field Centre, Montford Bridge, Shrewsbury SY4 1DX.

18-20 Sept. Keweenaw Peninsula, Michigan. First Annual midwest bryological foray. For further details see Bryol. Times 9:8.

19-20 Sept. BBS. Lancaster, England Annual paper reading meeting and Annual general meeting. Booking form from Dr. A.J.C. Malloch, Dept. Biol. Sci., Univ. of Lancaster, LA1 4YQ. For further details see Bull. B.B.S. No. 38:10-12.

28-29 Nov. BBS. London. Taxonomic workshop meeting at Thames Polytechnic. Further details in Bull. B.B.S. No. 38:12 and from the local secretary Dr. P.D. Coker, School of Biological Sciences, Thames Polytechnic, Wellington St., London, SE18 6PF.

1982

14-19 June. CEBWG. Prague 3rd biennial meeting. For further details see Bryol. Times 9:10.

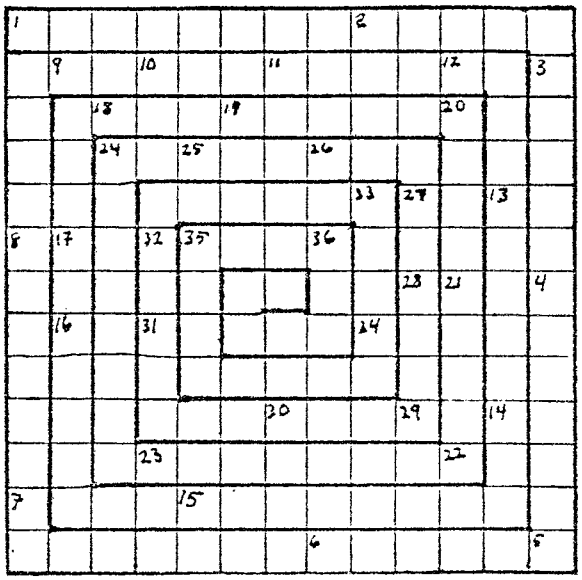
1983

Feb. Dunedin, New Zealand. Pacific Science Congress. See preliminary notice Bryol. Times 3:4.

SPIRAL MOSSWORD

by R. Rednaz

For each number, guess the bryologically related word from the clue. The words overlap, the last letter(s) of each word in the clockwise spiral are the same as the first letter(s) of the next word.



Clues

1. Leaves divided to base into four lobes, each lobe of a single row of cells.
2. Kind of pore.
3. Cylindrical and smooth.
4. Running out.
5. Leaves "imbricate, sometimes ± complanate, concave, ovate-oblong, margin plane or recurved below, entire or denticulate above; nerve very short and double or absent; cells linear-vermicular, porose, shorter at base, at basal angles ± quadrate ....."--Smith, Moss Fl. Brit. Irel.
6. "Autoecious. Leaves crisped when ± dry, spreading when moist, from ± sheathing base narrowed to lanceolate or subulate limb; nerve reaching apex or excurrent; basal ..... angular cells differentiated. Capsule...strumose....." ---Smith, ibid.
7. John Lewis *******, 1808-1873, American hepaticologist and lichenologist.
8. A light spear--Latin.
9. Basal angles of leaf.
10. A bristle-like point.
11. Stalk, breed, race--German.
12. Mosses, heads on beer, cabinboys --French.
13. Not stalked.
14. Pincushion moss.
15. Named after author of South American moss flora.
16. Race, breed, kind--German.
17. Plant body not differentiated into leaves and stem--French.
18. Thin--Greek combining form.
19. The Twisted Moss.
20. Blade, sheet--Latin.
21. Bare, plain--German.
22. Covered with a felt of soft matted hairs--Spanish.
23. Looks like *Fissidens*.
24. Long leaf point.
25. Between urn and seta.
26. Carina.
27. Segment of a thallus.
28. Rostrum
29. Short--German.
30. Orthotrichaceae; stems erect, peristomate, calyptrae cucullate, rarely hairy.
31. How many genera are there in the Archidiaceae?
32. Found among the spores.
33. Turned to one side.
34. Amphigastrium.
35. Uncombined, loose, unrestrained, postpaid--German.
36. With sharp angles between the lobes.

THE INTERNATIONAL ASSOCIATION OF BRYOLOGISTS publishes The Bryological Times every 2 months, the Bulletin of Bryology every 6 months and Advances in Bryology every 2 years. Items for the Bulletin should be sent to Dr. S. R. Gradstein by the 1st May or the 1st November each year while submission date for the Advances should be agreed with Dr. W. Schultze-Motel (Berlin). The editors do not accept responsibility for views expressed by authors in any of the articles published under their control.

For further details regarding the International Association of Bryologists, membership (currently US $5.00 p.a.) etc. write to the Honorary Secretary, Dr. S.R. Gradstein, Instituut voor Systematische Plantkunde, Heidelberglaan 2,3584 CS Utrecht,Netherlands.

ITEMS FOR THE NEXT ISSUE of The Bryological Times to be with the Editor, Dr. S.W. Greene, Department of Botany, The University, London Road, Reading, RG1 5AQ, England by 15 Oct. at the latest.

Correspondence concerning mailing etc. of The Bryological Times to M. A. van Slageren, Instituut voor Systematische Plantkunde, Heidelberglaan 2, 3584 CS Utrecht, The Netherlands.

Published in Utrecht