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OUT AND ABOUT

In India

By S.S. Kumar

SINCE THE TIME OF PROFESSOR S.R. KASHYAP, in the early twenties of the present century, Panjab University (now at Chandigarh) has been a centre of active research in bryology. Already four books entitled, Liverworts of the Western Himalayas and adjacent plains Vol. I and II; An introduction to the taxonomy of Indian mosses and Mosses of the Western Himalayas and adjacent plains, have been published from this laboratory. The manuscript of a fifth book providing an illustrated, systematic account of the Dicranales, Ditrichales, Syrrhopodontales and Pottiiales is ready to go to press. In this laboratory the author and his students are working on the systematics, cytology, morphology and ecology of bryophytes with particular reference to the selection of genotypes which are pioneers in colonizing bare soils. A biochemical study, particularly an analysis of secondary metabolites, is shortly to be undertaken.

At Delhi, Prof. R.N. Chopra - an energetic and an enthusiastic bryologist - and his students are engaged in experimental studies on bryophytes. Their main areas of interest are: protoneurmal differentiation, bud formation, reproductive biology, calyx induction, apogamy and apospory. A large number of taxa have been successfully brought into axenic cultures by inoculating spores, apical notches and gemmae. Prof. Chopra intends to undertake a study of photomorphogenesis and responses of bryophytes to pollution. Also in hand is the writing of a book on the biology of bryophytes.

At the University of Lucknow Prof. R. Udar, an untiring and most unassuming hepaticologist, has been actively engaged in taxonomic, morphological, palynological, ecological and experimental studies of Indian liverworts for nearly four decades. Jointly with his teacher, the late Prof. S.K. Pande, and with his students (V. B. Singh,

V. Chandra, S. C. Srivastava, Dinesh Kumar, Devendra Kumar Singh, Virendra Nath, U.S. Avasthi, Farhat Shaheen, Adarsh Kumar and Miss Asha Gupta), he has published over 175 research papers, one monograph and two books. He has recorded many liverworts new to the Indian flora and described an equally impressive list of species new to science. Among his most recent new finds are: *Folioceros pandii*, *Notothylas khasiana*, *Calobryum dentatum*, *Calobryum indicum*, *Frullania hattoriantha*, *Cephaloziella dentifolia*, *Cephaloziella meghalanjensis*, *Archilejeunea minutilobula* and *Schiffneriolejeunea indica*. Presently Prof. Udar and his team are surveying the hepatic flora of South India, with many interesting results already to hand.

At the Birbal Sahney Institute of Paleobotany, Lucknow, Dr. D.C. Bhardwaj, another student of the late Prof. S.K. Pande, has been stealing time to attend to his first love - Indian Anthocerotales. Attracted to this ancient group of Hepatophyta in 1948, Dr. Bhardwaj has made significant contributions to our current understanding of the morphology and taxonomy of Indian Anthocerotales and has erected the new genus *Folioceros* in this group of hornworts.

At Allahabad, Dr. K.P. Srivastava is working on the morphology and systematics of Himalayan liverworts, and Dr. J.P. Srivastava is engaged in compiling an illustrated taxonomic account of mosses of Naini Tal, which he collected during several botanical tours (including some with Mr. A. H. Norkett, formerly of the British Museum (Natural History) London). This important publication is awaited with interest.

Also at Allahabad, Mr. N.S. Parihar, a well-known person for his book on Bryophyta, jointly with his students, has been

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BRYOLOGICAL ACTIVITIES IN N W HIMALAYA, INDIA.

By Giri Pant

FROM 1979 onwards, a programme of bryological research has been undertaken in the Kumaun region of NW Himalaya, India. Although many papers and several books (e.g. Kashyap, 1929 - 32; Chopra & Kumar, 1981) have been published on the bryophytes of the region, much field and herbarium work remains to be undertaken. The main objectives, and some preliminary results, of the programme are as follows.

Exploration of the bryophyte vegetation of the NW district of Naini Tal is being carried out in an area with an altitudinal range of 326m - 2,600m with particular reference to the different types of habitats, microhabitats and niches in which bryophytes grow. This work will be gradually extended to cover the bryologically more interesting sister districts of Almora and Pithoragarh, also in the Kumaun region. 12 species of mosses appear to be new records for NW Himalaya, whilst 5 moss species (as yet unpublished) are new to the Indian bryoflora.

More than 300 species of mosses and approximately 100 species of liverworts are estimated to have been collected from, and on the way to, the famous Pindari Glacier during 1981-82, covering an altitudinal range of 2,250 - 4,000 m.

A survey is being carried out of various mineral-rich substrates in the districts of Almora, Naini Tal and Pithoragarh and has led to a collection of 14 species of liverworts and 39 mosses. *Grimmia pulvinata* (Hedw.) Sm. was the sole colonizer of micaceous granitic gneisses. A species of *Grimmia* and *Racomitrium himalayanum* (Mitt.) Jaeg. were found to be the main occupants of granitic rocks and boulders of the high altitude Pindari areas. The graphite schists were commonly vegetated by *Bryum cellulare* Hook. A

[continued on page 2, Col. 2]

[continued from page 1, Col. 2] engaged in studies of the taxonomy, developmental morphology and ecology of bryophytes. His study of bryophytes as rock builders is of particular interest and is now being continued by Giri Bala Pant at the University of Garhwal. She is also analyzing the mineral status of the various substrata of the bryophytes.

At Naini Tal, Dr. H.S. Kanwal (Govt. College, Naini Tal) is working on the cytology of liverworts of that area, and so far he has published interesting cytological results on eight species. He has considerable unpublished data on the cytology of liverworts to hand.

In Rajasthan there are two schools of bryology. At Rajasthan University, Jaipur, Dr. P.D. Sharma and his students are undertaking a survey of the moss flora of their state. Also their work on the developmental morphology of Pottiaceae is of considerable interest. At the University of Udaipur, Dr. K.R. Bapna is working on the bryoflora of Rajasthan. He is mainly interested in the taxonomy of liverworts and mosses.

In Madhya Pradesh, Dr. R.K. Koul (Dept. of Botany, Indore University, Indore) is studying the effect of pollutants on the growth and development of bryophytes. Dr. Kaul is also interested in physiological ecology.

In Maharashtra, the late Prof. T. S. Mahabale of Poona University, undertook bryological activity in 1941. His interesting work on the morphology, taxonomy and cytology of liverworts and mosses is being continued by Dr. N. V. Biradar and Dr. G. T. Dahade. These bryologists are actively engaged in the study of the bryoflora of the Western Ghats. Recent new finds include: *Phaeoceros panhalensis*, *Folioceros mahabalei*, *Notothylas kashyapii*, *N. pandei*, *Plagiochasma purandharensis* and *Cyathodium epi-phytens*.

In southern India, Dr. K.S. Srinivasan (Dept. of Botany, University of Anamali) has already published a book on the moss flora of that area. He is continuing his work on the systematics and ecology of mosses.

In eastern India, Prof. H.C. Gangulee's monumental work on the mosses of eastern India and adjacent areas is being continued by Dr. J.N. Vohra (Botanical Survey of India, National Herbarium, Calcutta). Dr. Vohra has published many new records of mosses for India, and his new book *Hypnobryales suborder*

Leskeineae (Musci) of the Himalayas has just appeared. It is a taxonomic account of 161 species, belonging to 42 genera and 6 families and has been published by the Botanical Survey of India, Calcutta.

Interest in bryophytes is growing rapidly in India. Many young students scattered in various laboratories throughout the country have entered the field with devotion. It is hoped that within the next ten years, the number of Indian bryologists will rise manyfold.

It is a joy to thank Dr. S. W. Greene, Department of Botany, University of Reading, U.K. for his interest and encouragement which has inspired many workers in India to strive for still higher standards and achievements.

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characteristic *Jungermannia-Campylopus-Dicranum-Scopelophila* community grew on iron-limonite bearing strongly acidic substrate. The moss *Campylopus sedgwickii* Dix. was observed to be "building up" soft porous "iron-tufa" as it receives limonite-charged water. The presence of the circumpolar, arctic-alpine *Pohlia crudoides* (Sull. & Lesq.) Broth. was a characteristic feature of flushed limonite cliffs, while *Macrothamnia pilusula* (Mitt.) Fleisch., *Oxystegus* and *Tortella* spp. were the chief colonizers of iron hematite deposits. *Campylopus* sp. was the dominant moss of a gypsum community. In all, 11 bryophytes were seen to be heavily encrusted with calcite forming solid accretions of calc-tufa. Over dolomitic rocks and boulders, *Anoetangium thomsonii* Mitt., *Barbula* sp., *Hymenostylium recurvirostrum* (Hedw.) Dix., *Hyophila involuta* (Hook.) Jaeg., *Tortella tortuosa* Hedw. and *Zygodon viridissimus* (Dicks.) R.Br. were found to act as primary colonizers. Only a single moss, *Hymenostylium recurvirostrum* var. *cylindricum* (Bartr.) Zand. grew on magnesite rocks and boulders, while soapstone rocks supported a scanty cover of lichens and *Frullania* sp. A lush luxuriant *Marchantia-Barbula-Mielichhoferia* community was noticed on polymetallic copper deposits at Askot (Pithoragarh District).

This part of the study of mineral-associated bryophyte species and communities, their preferences, tolerances and importance as indicators of metallic enrichment, was conducted

BRYOPHYTA NEOTROPICA EXSICCATA

THE INSTITUTE OF SYSTEMATIC BOTANY, University of Utrecht, is starting the publication of a new series of bryophyte exsiccates: *Bryophyta Neotropica Exsiccata*. The primary purpose of this series is to present to other herbaria, and colleagues interested in tropical bryology, a selection of carefully-determined bryophyte species from the different parts and environments of tropical America. Each specimen has been examined by a specialist of the group concerned: where available, a reference to recent taxonomic literature concerning the species is printed on the label. It is hoped that the series may help in increasing knowledge of neotropical bryophytes and promoting activity and exchanges among bryologists interested in tropical bryology.

Bryophyta Neotropica Exsiccata will appear in fascicles of 50 species each. The first fascicles, in fifty sets, will be ready for distribution in the course of 1984. The series is being offered on an exchange basis. Contributions to future fascicles are welcomed. Sufficient material should be sent for making 50 duplicates. In return, a set of exsiccates may be offered.

Individuals or institutions interested in obtaining the series and able to send contributions should contact the editor, Dr. S.R. Gradstein, Institute of Systematic Botany, Heidelberglaan 2, 3584 CS Utrecht, The Netherlands.

under a Government of India, Department of Science and Technology, Ecology Project 1980-1983, (Principal Investigator, Dr. J.S. Singh, Reader, Kumaun University, Naini Tal).

Some ethnobotanical notes related with bryophytes of Kumaun Hills have been compiled from the inhabitants of this region during various collection trips.

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- S.D. Tewari, Dept. of Botany, D.S.B. Constituent College, Kumaun University, Naini Tal, 263 002, India.

A VISIT TO THE PEOPLE'S REPUBLIC OF CHINA by Paul L. Redfearn, Jr.

IN SEPTEMBER AND OCTOBER of 1983 a Sino-American Botanical Expedition to western Sichuan Province was planned with the objective of collecting vascular plants and bryophytes for distribution to North American herbaria. American participants were to include, in addition to myself (representing the Missouri Botanical Garden), David Boufford of the Gray Herbarium of Harvard University and Bruce Bartholomew of the California Academy of Sciences. In China we were to be joined by Chinese colleagues. The expedition was jointly sponsored by the National Geographic Society, the National Science Foundation, and Academia Sinica of China. Plans were to collect in areas rich in plant species, Mt. Omei and Mt. Wolong, in western Sichuan Province. Unfortunately, for various technical and administrative reasons, permission to collect was cancelled. However, Dr. Peter Raven, Director of the Missouri Botanical Garden, suggested that I plan to go to Beijing and other places in China if an invitation could be arranged. Subsequently, my wife and I were invited to visit the Institute of Botany in Beijing. Later, trips were arranged to Kunming and Chengdu.

My visit to Beijing afforded me the opportunity to work with Wu Pan-chen and his colleague Lou Jian-shing and to study some of the bryophyte collections from Mt. Omei. I was able to examine over 800 collections, mostly made by P. C. Chen in 1942. Most were not identified. Many of the collections belonged to troublesome taxa in the Neckeraceae, Meteoriaceae and Pterobryaceae, and because my time was limited, I was unable or unwilling to identify these taxa beyond the generic level. There is at Beijing a large collection of bryophytes from Mt. Omei, mostly undetermined, made by Lou who plans to write a bryoflora for Sichuan Province.

In Beijing Wu and I began work on a check-list of the mosses of Sichuan and Yunnan. Based on the literature and identified collections deposited in the herbarium in Beijing, we now list over 560 taxa of mosses from Sichuan alone.

While in Beijing I had the opportunity to meet Wan C.L., P.C. Chen's widow. She is 78 years old and related some of her experiences with her husband to Zenoske Iwatsuki, who was also in Beijing, and myself (Fig. 1).

On September 29, I met with all but two or three of the active bryologists in Mainland China (Fig. 2). They were attending a meeting of the Botanical Gardens and I was invited to talk to them about bryological research in the United States and Canada.

After my wife Alice joined me in China, we visited the Institute of Botany in Kunming. Unfortunately, Li S.J. was not in Kunming at this time because she was in Finland studying with Koponen. However, her husband Zang Mu served as our host and made facilities available for me to continue to study Chinese mosses. The herbarium at Kunming is relatively new and working conditions are very pleasant. Their holdings in bryophytes are primarily from Asia and many of the collections are determined only to family or genus. Zang Mu was a most gracious host and made sure that we saw the interesting and beautiful places in the Kunming area. I was particularly gratified that he took us to West Hills near Kunming where I was able to make a small collection of bryophytes.

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Figure 1. Bryologists at the Institute of Botany, Beijing. From left to right. He, S.; Hu, Renliang; Wan, C.L., (P.C. Chen's widow); Mrs. Z. Iwatsuki; Lou Jian-shing and Wu Pan-chen.

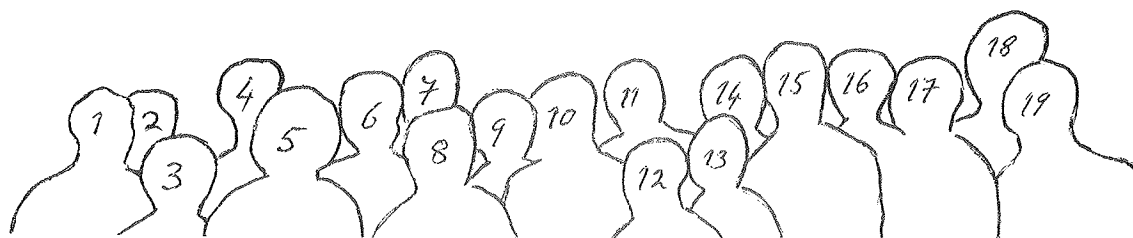


Fig. 2. Chinese bryologists with Dr. Redfearn at the Botanical Garden, Institute of Botany, Academia Sinica, on September 29, 1983.

1. Jiang, S.Z.; 2. Guo, M.S.; 3. Zhang, M.X.; 4. He, S.; 5. Dai, L.K.; 6. Xu, W.X.; 7. Hu, R.L.; 8. Lou, J.S.; 9. Wang, Y.F.; 10. Paul Redfearn; 11. Wu, P.C.; 12. Wang, C.L., (P.C. Chen's widow); 13. Zeng, S.Y.; 14. Aur, C.W.; 15. Gao, C.; 16. Liu, Z.L.; 17. Li, D.K.; 18. Zhang, G.C.; 19. Cao, T.

While in Kunming I was able to visit Professor Xu Wen-xuan at Yunnan University. He has three graduate students in bryology (Fig. 3), and I spent a morning exchanging ideas with them. The herbarium at the University contains mostly Asian material.

From Kunming we went to Chengdu in Sichuan Province. The staff of the Institute of Biology arranged for us to visit Mt. Omei for a day. This visit only heightened my disappointment that our planned expedition did not materialize. The bryoflora is certainly spectacular and complex, and I am sure that I would not have been able to cover the area adequately in the two months that had been planned for the expedition. I also had the opportunity to visit the Plant Systematics staff of Sichuan University. At neither Sichuan University, nor the Institute of Botany, is there anyone working on



Fig. 3. Zang Mu, Professor Xu and his students at the University of Kunming.

From left to right:
Xiong, Ro-li; Qian, Ming-kun; Prof. Xu, Wen-xuan; Zang, Mu;
Xiao, Guo Ping; Zhang, Jin-kun and Li, Zhi-ming.

bryophytes and this is truly unfortunate because the western part of Sichuan is obviously very rich.

My impressions of Chinese bryology are limited as one might expect when so little time is spent in a country as vast and diverse as China. Certainly the bryologists I met were competent and enthusiastic. They are hindered by inadequate contact with the West and by the lack of extensive collections from other parts of the world that can be compared with Chinese taxa. Consequently, there is, and has been, a tendency for Chinese bryologists to describe many new taxa. Good revisions or monographs encompassing both Far Eastern, Indo-Malayan and North American taxa will help to determine the validity of many of these taxa from China.

Perhaps my most important impression of bryology in China is that there is the need for more contact between western bryologists and our Chinese colleagues. We have much to learn from working with each other in the study of Chinese bryophytes. There is an urgent need for collecting expeditions in China composed of foreign bryologists and the Chinese. Political, transportation and language problems dictate that such expeditions must be made jointly with Chinese colleagues. Such arrangements are not easily made and we must be patient and tolerant of the problems encountered in doing field work in China.

Two other impressions are worth noting. First, there seems to be a lack of North American collections in their herbaria. We should seek to establish exchange programs with herbaria in China. Second, the Chinese are concerned about the fate of the types of new taxa described from China, and I would suggest that in agreements between Chinese and foreign collectors, that it be explicitly stated that type specimens will remain in Chinese herbaria.

I am personally excited about the future of Chinese bryology. At the time of writing it appears that our Sino-American Botanical Expeditions will be re-scheduled for the summer of 1984. I look forward to returning to China and to the opportunity to do field work with my Chinese colleagues.

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MOSSES IN THE GUINNESS BOOK OF RECORDS

By N. Takaki

AS STATED BY S.W. GREENE (Bryol. Times No. 23: 4, Nov. 1983), the Guinness Book of Records, under its article "Mosses", listed the pygmy moss (*Ephemerum*) as the smallest, and the brook moss (*Fontinalis*) as the largest form. In this record, however, no specific names of these extreme genera, nor any description of the dimension of the smallest, was given.

A short time ago I discussed the Guinness Records, with some comments in Japanese, in *The Proceedings of the Bryological Society of Japan*, 3 (2): 27-28, 1981. Since then, I have searched the literature again for descriptions of species of these genera which would state clearly their dimensions.

In W.H. Welch's *A monograph of the Fontinalaceae*, 1960, the description: "stems up to 90 cm in length", given for *F. dalecarlica* seems to be the largest in this monograph. E. Nyholm also described this species as "plants from 10 cm to nearly 1 m. long" in her *Illustrated moss flora of Fennoscandia*, fasc. 4 (1960). As of now, *F. dalecarlica* seems to be the largest species of *Fontinalis*.

In his *Moss flora of North America, north of Mexico*, 1935, A.J. Grout gave the description for *Nanomitrium austinii* (*Ephemerum grandifolium*) as "plants with short stem, 0.1 mm. long, leaves reaching 1 x 0.16 mm.", and for *Ephemerum megalosporum*, as "leaves, upper reaching 0.6-1 x 0.36 mm.". Those seem to be the smallest records in the *Ephemeraceae* cited in his book.

In the case of the smallest taxa, such as those in *Ephemeraceae*, the stem is so short, and the leaves surrounding it so few, that the length of foliage is almost equal to that of the whole plant. The species, *E. megalosporum* (= *Micromitrium megalosporum*), known hitherto only from U.S.A. and Cuba, was found recently in Japan (Iwatsuki Z. and N. Takaki in *Proc. Bryol. Soc. Japan* 3 (5): 68-72, 1982). In our specimens, with mature capsules, the length of the plants is about 0.4 - 0.7 mm. where stems are merely 0.08 - 0.12 mm. long.

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A BIBLIOGRAPHY AVAILABLE IN CARD FORM

M.R. Crosby & C.R. Bauer

THE SERIES, *Recent Literature on Mosses* (RLM) has appeared regularly in *The Bryologist* for over 50 years, the first list appearing in 1932. For the past several years, we have been compiling the lists using a word processor, which generates both the manuscript and a 3 x 5 inch card for each citation. Beginning with RLM-125, summer 1983, sets of cards are available at a cost of 2.5c. per card, which covers the cost of purchasing card stock and postage. Those wishing to receive sets of cards are encouraged to establish standing orders, though individual sets are available; the price of each instalment is indicated in a footnote. Cards for standing orders are generated, mailed, and billed shortly after the manuscript is sent to the editor. Sets available and their prices are: 125, \$7.60; 126, \$3.60; 127, \$3.85; 128, \$5.00; 129, \$4.50.

RLM is based on scanning some 1,300 systematic and ecological serials received by the Missouri Botanical Garden Library, recent acquisitions of books by the Library, and reprints sent to the authors. No title is included in RLM unless it has been seen and its citation verified by the authors. RLM seems to cover the field reasonably well: Jan Peter Frahm (Bryol. Times 25:2, 1984) found that 92% of 50 citations randomly selected from the literature were included. But, we recognize that some literature is overlooked due to the nature of the acquisitions' policy of our Library. Therefore, authors of articles outside our general sphere, i.e. systematics, are encouraged to send reprints so that citations can be included in future issues.

Orders for cards should be prepaid with cheques or money orders made out to the Missouri Botanical Garden, and sent to one of us. Be sure to indicate which lists you want and whether you want to establish a standing order.

Missouri Botanical Garden, P.O. Box 299, St. Louis, Mo 63166 - 0299, U.S.A.

Deaths

VERDOORN, Frans, on the 18th of May, 1984, in Utrecht.

TECHNIQUES NOTEBOOK

Photographing Bryophytes

by Janice M. Glime

I OCCASIONALLY GET A LETTER from some faraway place asking how I take pictures of mosses. Each of us has a favorite method, often depending on our budgets and how much equipment we wish to carry. Since most bryologists operate on small budgets, I include here some inexpensive methods.

A single lens reflex camera with macrolens or normal lens (non-macrolens) with a set of extension tubes or close-up lenses is minimal equipment for photographing bryophytes.

From Zen Iwatsuki, Horishima University, Japan, I have learned several field techniques. I prefer a fast (400 ASA) film, which permits me to get something under most daylight conditions, even in forests, but this means sacrificing the fine grain quality of slower films. Dr. Iwatsuki uses the slow films with a small flash. Table 1 shows the required f stop for flash with a guide number of 20 (ASA 100). This flash weighs only 130g with two AM-3 batteries. Three years ago he showed me how to use a white handkerchief to reduce the bright flash for close-ups. This requires a test film to determine the necessary f/stop at several close distances with this reduced light. The light could be calculated using the guidelines provided by the flash and using a light meter to determine how much daylight is reduced by the handkerchief, then compensating. The new integrated light meter in the Olympus OM-2 is ideal (but the body costs about \$700) and eliminates the need for calculating. The flash method provides rich colors which are desirable for making prints. It is best if the flash is supported. A bounce flash shoe can be used for directing it up or down, and this will be necessary for close-ups.

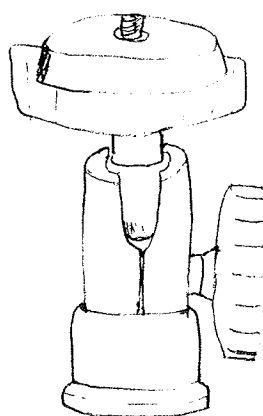


Fig. 1. Tripod head with second head added.

For less contrast, natural light is preferable. Dr. Iwatsuki has borrowed the methods of a Japanese professional photographer (Mr. M. Izawa) who first "weeds" the mosses. Most leaves, needles, grasses, etc., are removed, using a fine forceps, but a few are left near the edges to provide perspective and make it look more natural. Dry mosses can be sprayed with water. A tripod can be used, and since most mosses are too small to be affected by the wind, time exposures can be used of several seconds. If you have a tripod head which can be re-positioned, and add a second head for positioning (Fig. 1), the short arm on the tripod head can be used as a tripod leg. Thus the tripod can be placed on its side for things close to the ground (Fig. 2). So we now have a small tripod at a reasonable cost that can be used as above with two heads. A cable release should always be used.

If you don't care to carry a heavy tripod, make use of nature. Brace the camera against a tree or on a rock, or brace your elbow there. Free arms are not very stable. I have succeeded in photographing *Schistostegia pennata* at a 2-second exposure by cushioning the camera on a nearby rock, securing it

with one hand, and holding my breath while I depressed the button. Holding your breath reduces body movement. A cable release helps even if you have no support for the camera. Sometimes a knee can serve as support. With one of these various supports, a 1/15 second exposure can be clear, but at least two should be taken in case of movement. With a good support, a long (2 second or more) exposure can be better than a short one because most of the movement occurs when the button is pushed. Find out your own steadiness limits and don't ever shoot slower than that. Anything less than 1/30 seconds is chancey.

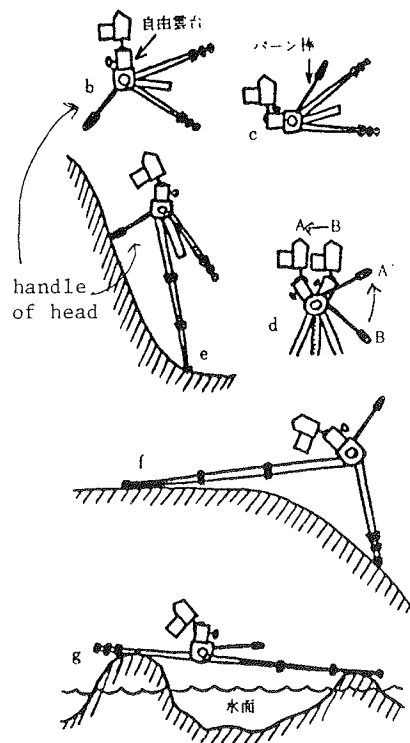


Fig. 2. Showing tripod in use for positioning camera. (After Izawa, M. 1982. Camera work for mosses 2. Proc. Bryol. Soc. Japan 3 (6): 95-98, in Japanese).

Table 1. F stop values using a flash with a guide number of 20

ASA	DISTANCE			
	24cm	30 cm	50 cm	1 m
100	f22	f16-22	f16	f16
64	16	11-16	11	11
32	11	8-11	8	8
25	11	8	6.3	6.3

* Column Editor, Janice M. Glime

If your lens does not allow you to get close enough, you can use a normal, or a macrolens back to front on a camera if it has a special reverse adaptor or reversing ring. With this combination you cannot use the focusing ring of the camera; you

must move the camera back and forth. A bellows attachment is another method of focusing close to a moss. This becomes bulky, requires high light, and must be motionless. It is usually preferable to move the moss somewhere with better working conditions.

People who need eyeglasses may have difficulty in focusing on small mosses. Most camera eyepieces will accept a small correction lens which is available at some camera shops. The lens must be correctly suited to the eye problem.

Light reflected from a moss is often not representative of the surrounding light. I find that for light-colored mosses (and most flowers) I can get the best light reading off the palm of my hand. High contrast should be avoided. A dark green *Grimmia* on a light granite rock never photographs well. Likewise, red *Ceratodon* capsules against a blue sky always seem to cause problems. Our eyes can't handle the dark and light at the same time. When photographing wet mosses, or through water, beware of glares; your shadow can remove these and a polarizing filter can help.

Size perspective is especially important for a non-bryological audience. If the use of coins, rulers, pens and pocket knives disturb your aesthetic appreciation, add some familiar object from nature, such as an acorn, pine needle or cone. These are somewhat variable in size, but they help.

Always use the smallest opening possible (largest f number, since it is the denominator of a fraction) for the available light. An opening of 2.8 or 3.5 will render most of your subject out of focus and probably make a displeasing picture. Also, be sure to vary perspective. Take some shots looking up at the moss. Use backlighting (i.e. get the moss between the camera and the light source) to highlight calyptra hairs. Decide first what made you recognize the moss in the field and then try to capture that in the picture.

With a lot of trial and error you can adapt a single lens camera for use with many kinds of microscopes. You must remove the lens of the camera, and use the eyepiece lens of the microscope. Make a tube from cardboard to seal the camera to the eyepiece. This tube will be about 12-15 cm long, but you must adjust it for your system. A flat field wide angle eyepiece is best. The camera will greatly reduce the area in

view, so an eyepiece of only half the magnification will get you about the same field of view. Adapters are sold for many cameras, and these work well with trinocular and monocular microscopes. You might want to install a reticule, graticule, or other measuring device into the eyepiece so that a permanent size record is part of your picture.

A dissecting microscope can be used for small mosses like *Andreaea*. When using a dissecting microscope you can increase the light by using fiber optics at a high intensity, or by use of flash. Geert Raeymaekers (currently at Michigan Technological University, Houghton) showed me that toilet tissue, lens paper or thin white cloth over the light source will eliminate most of the glare on the wet surface of a moss. A completely submerged moss is easier to make glare-free than one that is simply moist because the submerged moss confines its glare to the plane of the water surface and the glare can be avoided.

Record your pictures, camera settings and conditions so you can learn from your successes and mistakes.

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

Membership of IAB

THE FOLLOWING LISTS, for the period 1st March - 30th April, 1984, update those already published. The last list appeared in *Bryol. Times* 26:8.

New Members

Fernandez Ordóñez, M., Carmen*;
Giovanna Dia, Maria*;
Koedam, Nico*;
Malme, Leif*;
Newton, A.E.*;
Raimondo, Francesco M.*

Addresses

Fernandez Ordóñez, M., Carmen,
Dpto. Botánica, Facultad de
Biología, Universidad de
Oviedo, Asturias, Spain.

Giovanna Dia, Maria, via del
Caratinieri 32, I-90146,
Palermo, Italy.

Koedam, Nico, Vrije Universiteit
Brussel, Dienst - A.P. Naplein
2, B-1050, Brussels, Belgium.

Malme, Leif, Skrabben 1c, Oslo
6, Norway.

Newton, A.E., 51, Whiteknights
Road, Earley, Reading, England.

Raimondo, Francesco M., Via la
Marmora 75, I-90146 Palermo,
Italy.

Letter to the Editor

DURANT LES ANNÉES, Mme. S. Jovet-Ast, trop prise par le travail administratif de la chaire de Cryptogamie (Muséum National d'Histoire Naturelle, Paris), ne pouvait mener à terme dans les conditions satisfaisantes son travail de recherche, aussi, elle nous affirmait souvent mi-sérieuse, mi-ironique: "je ferais tout cela quand je serai à la retraite!" Enfin, le 1er octobre 1982, elle retrouve avec un vif plaisir son microscope et sa loupe binoculaire pour continuer d'élucider les problèmes posés par la taxonomie des *Riccia* et des *Colura*. *Cryptogamie, Bryologie-Lichénologie*, dont elle est toujours la Directrice, publie en 1983, deux articles sur les *Riccia* et un sur les *Colura*. Déjà, un manuscrit est en attente de publication à *Cryptogamie*, et d'autres sont en cours ou presque terminés. Elle ne délaisse par pour autant les autres Cryptogames. Elle collabore au Centenaire de la Société Mycologique de France (1884-1984) par un article sur les botanistes mycologues du Muséum d'Histoire Naturelle. Voilà un début prometteur, et nous lui souhaitons un retraite la plus longue possible.

Pour l'encourager, et aussi pour la remercier de ce qu'elle a déjà apporté à la bryologie, la rédaction de *Cryptogamie, Bryologie-Lichénologie*, en l'honneur de ses 70 ans, a fait appel à ses amis pour lui faire l'hommage d'un double fascicule de cette revue.* Le résultat est là: 23 contributions et 220 p. de texte, préfacées par Mme. Plin, une amie d'enfance de Mme. S. Jovet-Ast.

Nous lui souhaitons un bon et heureux anniversaire!

D. Lamy. Muséum National d'Histoire Naturelle, Laboratoire de Cryptogamie, 12, rue de Buffon, 75005, Paris, France.

[* This volume is available from *Cryptogamie, Bryologie-Lichénologie*, 12 rue de Buffon, F-75005, Paris, at a price of 160 French francs. Editor.]

Note* Addresses are only given for those members with an * after their surname or family name, i.e. for those whose names will not be found in S. R. Gradstein's *Directory of bryologists and bryological research*, Ed. 2, (*Regnum Vegetabile*, Vol. 99, 1979), or where their present address is different to that given in the *Directory*.

A NEW APPROACH TO THE PRODUCTION OF TYPE REGISTERS

By S.W. Greene

DURING A VISIT to the United States of America, in May 1984, the author discussed with herbarium curators in New York (NY); Chicago (F); St. Louis (MO) and Washington D.C. (US), various ways of producing type registers for the different groups of plants. Since, what may be called, the specimen-based approach has produced singularly little results so far, it appears that another method is called for, if the desired end-product is to be attained.

The method the author suggested involves a literature-based approach rather than a specimen-based approach, i.e. it starts with an original description rather than a specimen. Its essence is the compilation of details of specimens cited in the protologues of new taxa before searching herbaria for collections which match these details, rather than the traditional approach after specimens have been located, of attempting to validate what may be called "putotypes", (i.e. specimens thought to be types) by matching their details with the appropriate literature. Since the suggested method was well received, the author has been encouraged to set out briefly the advantages and disadvantages of both approaches.

The specimen-based approach has a number of disadvantages:

(i) It relies on curators going through herbaria and selecting "putotypes", usually by putting them in specially-designated, colour-coded folders.

(ii) It necessitates finding the appropriate literature (which may not be in the herbarium library) to confirm the status of each specimen.

(iii) In the case of mosses, since the date of issue, rather than the title-page date, is used throughout Index muscorum, curators of bryophyte herbaria often have an additional hurdle to overcome to locate the literature they require.

(iv) When a specimen is found to agree with details in a protologue, it is not known where, if any, duplicates are to be located, so further search is required.

The literature-based approach starts at the opposite end and has the following advantages:

(i) All the details about the

specimens are known from the start.

(ii) An author may have designated a holotype and stated where duplicates have been lodged.

(iii) It is less time-consuming for a curator to locate and check the details of a specimen against information in a list, than search for published details to fit a specimen.

Pessimists will argue that the task of assembling specimen details from protologues will be too time-consuming for this approach to be of much value. This viewpoint would be justified if large card indices had to be assembled before any progress could be made. Fortunately the computer can divest the job of much of its tedium.

Assuming the basic nomenclatural data about taxa are held in computer files, as is the case for bryophytes, a type register of a group could be prepared as follows:

(i) A printout would be obtained of taxa described by a particular author.

(ii) Details would then be extracted from the author's publications of each specimen cited in the protologues and entered on the printout.

(iii) Specimen details are entered in the computer with sorting codes for a number of fields, e.g. habitat, locality and country, collector and date, etc.

(iv) A printout, showing collecting details of specimens is circulated to herbaria likely to have specimens matching the details in the protologues.

(v) Curators return checked lists, having added the acronym of their herbaria (as listed in Index Herbariorum), together with herbarium accession numbers where these exist.

(vi) These lists are published.

The computer files can be updated at any time as new information comes to hand and lists of up-dates can be published. So long as cumulative indices, suitably structured, are also published, a user can have rapid access to available information.

It is, of course, appreciated that a variety of problems can be posed by the details cited in a protologue and for older specimens in particular, the recognition of a type is often far from easy. Nevertheless, it is possible that this approach could bring nearer the availability of type registers.

To test the practicality of the method, it is intended to carry out a pilot study based on the taxa described by C. Müller

(1819-1899) of Halle. As is well known, he described taxa from all over the world, and his personal herbarium was destroyed in Berlin (B) during the 1939-45 war. Isotypes and syntypes of some taxa he described have been located in other herbaria, but it is not known how much authentic Müller material is extant. Anyone interested in the project, or who has knowledge of the whereabouts of Müller isotypes or syntypes, is invited to write to the author.

It is planned to announce the details of the Müller type project in a later issue of this Newsletter.

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

Future Meetings

BRYOLOGY AT ICSEB III

THE THIRD INTERNATIONAL CONGRESS of Systematic and Evolutionary Biology will be held at the University of Sussex, Brighton, England, from 4-10 July, 1985. It will include a symposium on Bryophyte phylogeny: the origins and relationships of the major groups, which is being organized by R.E. Longton, on behalf of the British Bryological Society. Speakers will include Y. Asakawa (Tokushima Bunri University, Japan); Z. B. Carothers (University of Illinois, USA); J.G. Duckett (University of London, UK); M.E. Newton (Manchester University, UK) and B. Crandall-Stotler (Southern Illinois University, USA). It is planned that a session of contributed papers relevant to the theme of the symposium will also be arranged. Offers of posters or contributed papers, and requests for programmes and other information, should be sent to the ICSEB Congress Office, 130, Queens Road, Brighton BN1 3WE, Sussex, England.

SECOND PLANT LIFE OF SW ASIA SYMPOSIUM, ROYAL BOTANIC GARDEN, EDINBURGH 16 - 21 September, 1985.

THE SYMPOSIUM will primarily cover aspects of higher plant botany in SW Asia, such as vegetation, floristics, taxonomy, climate, weeds, genetic resources and plant biology. It will include a half-day section on Cryptogams, in which W. Frey (Berlin) and H. Bischler and S. Jovet-Ast (Paris) will present papers on the bryoflora of the region. A bryological excursion in the Scottish Highlands is planned, if interest is sufficient.

For further details contact I.C. Hedge, Curator of the Herbarium, Royal Botanic Garden, Edinburgh EH3 5LR, Scotland.

BASE MAPS FOR MAPPING

EUROPEAN BRYOPHYTES

A STOCK of 2,000 base maps (Atlas Flora Europaea model) are now available from the Secretary of the Working Group. Price 20 F. Belg. (= 0.25\$) each, plus postage.

Orders to Prof. Dr. R. Schumacker, Station Scientifiques des Hautes-Fagnes, Mont-Rigi, B-4898 Robertville/Waismes, Belgique.

Personalia

DR. JANICE M. GLIME will be on sabbatical leave from 1st June until 30th November, 1984. She will be doing field studies in Canada with Dr. Dale Vitt from 7th June until 25th June, in Japan with Dr. Zen Iwatsuki from 25th June until 9th August, and in New Hampshire with Dr. Nancy Slack from 1st September until 8th September. Mail will reach her by being forwarded from her Michigan address or may be sent directly from 1st September until 15th November c/o Dr. Dale Vitt, Dept. of Botany, University of Alberta, Edmonton, Alberta Canada T6G 2E9.

Payment in U.S. dollars for publications of the Hattori Botanical Laboratory should still be sent to her address in Houghton, MI, where they will continue to be processed during her absence.

Mrs. Lou Jian-shing of Beijing is working at the Botanical Museum, Helsinki, until mid-October 1984 on a scholarship provided by the Finnish Ministry of Education.

Brent D. Mishler has successfully defended his thesis "Systematic studies in the genus *Tortula*" and has been appointed an Assistant Professor in the Department of Botany, Duke University, beginning September 1984, to teach bryology.

Dr. T. Seki, of Hiroshima University, Japan, will be in Nairobi, Kenya, until November, 1984.

BRYOPHYTES, ACID RAIN AND HEAVY METALS

ANYONE DOING RESEARCH on acid rain or heavy metals and bryophytes may receive a register of bryologists doing air pollution research by dropping a note, including title of your research, names of researchers, and addresses, to Dr. Janice M. Glime, Acid Rain Project, Department of Biological Sciences, Michigan Technological University, Houghton, MI 49931, U.S.A. Your information will be added to a compilation of researchers, and in return you will receive a list of researchers and their projects. It is hoped that a yearly update can be printed, and that this will provide a forum for exchanging ideas and methodology and prevent duplication of effort. Please send names of others you know who are working with bryophytes and air pollution so that they may be contacted and included in the list.

ENGLISH LANGUAGE VERSION OF JAPANESE BOOK ON MOSSES

Mosses by Sylvia A. Johnson
Photographs by Mazana Izawa

A Lerner Natural
Science Book, 48pp.

THOSE OF YOU who have seen the beautifully illustrated Japanese book by Masana Izawa on mosses, will be delighted to know that it is now available in English (but do not try to use it to check your translating ability - it is not a direct translation).

The book is written in a way that it can be appreciated by a youth of about 12, and it does not lose its charm for anyone older. In it the life cycles of mosses and liverworts are carefully explained and contrasted with the seed habit of flowering plants. Some basic ecology of mosses is presented, with a discussion of *Sphagnum* and the peat-forming process. The ability of mosses to tolerate dry habitats for long periods of time helps to dispel the myth that all mosses require lots of water to survive.

Scientific names are used along with common names wherever names are applied, and a special page at the end is devoted to explaining the worldwide usefulness of the scientific names. The book has an index and a glossary. However, it lacks the illustrations which accompany the glossary in the Japanese version. Technical terms are provided with phonetic spellings which are easy to pronounce in the correct way (if one can accept the pronunciation of "o" in gametophyte and photosynthesis as "uh"). Names of mosses are written phonetically in parentheses in the text, as for example mar-SHAN-tee-uh.

However, the greatest charm of the book is still its photographs, and even this abbreviated version with only 64 of the 73 presented in the original still qualifies as a table book, bound to charm even your least botanical guests.

It can be obtained for \$8.95 from Lerner Publications, Co., 241, First Avenue North, Minneapolis, Minnesota 55401, USA. (phone 800-328-4929).

Janice M. Glime, Dept. of Biological Sciences, Michigan Technological University, Houghton, Michigan 49931, U.S.A.

Desiderata

Wanted : *Mylia* Species

WE ARE CURRENTLY WORKING on the chemistry of the liverwort genus *Mylia*. To investigate as many species as possible, we would be grateful to receive air-dried material from any part of the world; amount, as much as possible, at least 100 mg.

Attention: The plant material may not be washed after dessication.

Privatdozent Dr. Rüdiger Mues, Fachrichtung Botanik, Universität des Saarlandes, D-6600, Saarbrücken, West Germany.

NEW MANUAL OF BRYOLOGY

R. M. Schuster (Ed.)

Vol. 1, 1983. pp.v, 626, 79 maps, 246 text figs., 47 tables; 4to, cloth. Price Yen 10,000 or US \$45.00, inclusive of postage until 31st August.; ¥11,500 or \$50.00 from 1st September.

Vol. 2, 1984. pp.627-1295, illustrated. Price Yen 11,500 or US \$50.00 incl. of postage until 31st August.; ¥12,500 or \$54.00 from 1st September.

Available from the Hattori Botanical Laboratory, 3888 Obi-Honmachi, Nichinan-shi, Miyazaki-ken 889-25, Japan (Postal Giro Account: Kagoshima 8-4277) or John Johnson, Natural History Books, R.D.2, North Bennington, Vermont 05257, U.S.A. Johnsons are also acting as agents for other Hattori Botanical Laboratory publications.

Recent Publications

Australasian Bryol. Newsletter
No.10: 1 - 8, 1984.

Bryolatina No.3: 1-8, 1984.

Herzogia 6 (Ht.3 & 4): 329-505, 1984

J. Hattori Bot. Lab. No.55: 1-511, 1984.

Lindbergia 9 (No. 2): 73-136, 1983; (No. 3): 137-208, 1984.

DIARY

ABLS = American Bryological and Lichenological Society; BBS = British Bryological Society; CEBWG = Central and East European Bryological Working Group; DBLW = Dutch Bryological and Lichenological Working Group; IBC = International Botanical Congress; NBS = Nordic Bryological Society; SBLS = Swiss Bryological Society and Lichenological Society.

1984

July 18-25. BBS. Summer Field Meeting, Wooler, Northumberland. Local Sec.: Dr. P. J. Lightowlers, 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 Vosge, (Lüttenbach). For further information (and registration before 1st April), contact Han van Dobben, Mariaplaats 16, Utrecht 3111 LJ.

July 30-4 Aug. NBS. Kevo, Finland. At the University of Turku's Subarctic Research Station. Further information from Reino Fagersten, Kupion Museo Luonnont. os. Myhkyrintä 22, 70100 Kuopio 10, Finland.

Aug. 3-5. ABLs 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. ABLs. Annual Meeting Fort Collins, Colorado. For details see Bryol. Times 25:7.

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. Will-emse, Arboretumlaan 4, 6703 BD, Wageningen, The Netherlands.

Aug. 23-28. SBLS. 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 2NZ. For details see Bull. BBS, 43:14.

Sept. 28-30. Lamar, Pennsylvania. 9th A. Leroy Andrews Foray. For further information see Bryol. Times 26:8.

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

Nov. 23-25. Bryological Workshop. Duisburg and Robertville. Organizers Profs. R. Düll and R. Schumacker. See Bryol. Times 26:9 for further details.

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. Brighton, England. Third International Congress of Systematic and Evolutionary Biology. Bryophyte Symposium in collaboration with the BBS. For preliminary details see this issue p. 8.

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 Vácraót. Conference on Bryology. 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 16-21. Edinburgh, Scotland. 2nd Symposium on plant life in S W Asia. For preliminary details of bryological programme, see this issue, p. 8.

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. 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), Vácraót (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 August at the latest. Items for the Techniques Notebook should be sent direct to Dr. Janice M. Glime, Dept. of Biological Sciences, Michigan Technological University, Houghton, Michigan 49931, U.S.A.