

The BRYOLOGICAL TIMES

ISSN 0253-4738

Newsletter of the International Association of Bryologists

September, 1989

No. 51

Recent bryo-floristic exploration in China

by
Pan-Cheng Wu

A contribution to the Floristic and Phytogeography Column
edited by W.R. Buck and J. Váňa

Exploration of the Chinese bryoflora dates back to the nineteenth century (Wang, 1935; Koponen, 1984; Wu, 1984). In 1975, a very important epoch began when a large expedition to explore Quinghai-Xizang (Tibet), the location of the world's highest peak, Mt. Qomolangma (Everest), was organized by the Chinese Academy of Sciences. From 800 to more than 4000 meters above the sea level,

the area includes tropical and sub-tropical evergreen broad-leaved forests, deciduous broad-leaved forests, coniferous forests, meadows and alpine tundra. As one might expect, the bryoflora of Xizang is very rich and more than eight hundred species have been found (Chen, 1962; Li 1985b).

It appears that the area can be divided into 3 or 4 sub-regions based on the bryoflora (Gao *et al.*, 1981; Li, 1981, 1985; Lou *et al.*, 1983; Xu & Xiong, 1980; Zeng, 1984) and that the theory of continental drift is relevant as an explanation of the composition of the bryoflora (Wu & Lou, 1981).

From 1981 to 1985 the Chinese Academy of Sciences organized a sister expedition to the Hengduan mountains, with the participation of six bryologists from the Institute of Botany, Peking and the Kunming Institute of Botany. In China most of the main rivers and mountains flow from the west to the east, but in the higher areas the main mountain ranges and rivers suddenly turn to the south hence the name "Hengduan mountains". The area is rich in high cliffs and deep valleys and when climbing in the mountains collectors must pass through subtropical evergreen forests, meadows and alpine tundras as if going latitudinally from

continued over

Stanley Wilson Greene (1928 – 1989)



"The start of a new venture always brings moments for optimism..." Thus began the editorial to the first issue of *The Bryological Times* by which Stanley Greene introduced his successful newsletter. The words seem particularly characteristic of him. A man full of enthusiasm, energy and ideas and with a drive to get things done. A leading figure in bryology who passed away much too early.

Stanley Greene was a student at Trinity College Dublin where he took at first in botany and at the University College of North Wales where he specialized in bryology with Paul Richards like other prominent British botanists of his generation. Subsequently he held positions as curator at the British Museum (Natural History), as director of the Botanical Section of the British Antarctic Survey, as director of botanical research at the Institute of Terrestrial Ecology and as reader at

continued on p. 3

Contents

Recent bryo-floristic exploration in China.....	1
Obituary Stanley Greene.....	1
<i>Cryptoleptodon flexuosus</i> , a rolling moss from Kumaun Himalaya....	4
Taxonomic problems of mosses in Antarctica.....	5
Progress in nomina conservanda et rejicienda.....	7
Int. Symposium on Bryophyte Ecology, Edinburgh, July 1988..	8
Sixth meeting Central and East European Bryological Working Group, September 1988.....	9
Int. conference on experimental bryology and <i>Sphagnum</i> biology, Exeter, July 1991.....	9
Request for information on grant-supported bryological research projects.....	10
Book reviews.....	10
Announcements.....	11
Diary.....	12
Colofon.....	12

Exploration in China, continued

south China to north China. The existence of these different landscapes is the reason for the presence of distributional centres of the East-Asiatic bryophyte genera in Hengduan mountains as well as in south-eastern Xizang (Tibet) (Wu & Lou, 1981; Lou & Wang, 1983; Lou & Wang, 1986).

In addition, members of the Forestry and Pedology Institute and the Northeast Forestry University have collected in south-west, middle-south and south China for several years. A list of the mosses of north-east China has been published (Gao, 1982) as well as the "Flora Muscorum Chinae Boreali-Orientalis" and "Flora Hepaticarum Chinae Boreali-Orientalis" (Institute of Forestry and Pedology, 1977; Gao & Zhang, 1981). Members of the Xi-An Botanical Garden are interested in the bryoflora of north-west China and involved in the preparation of the "Bryoflora of Tsingling" (Zhang, 1974, 1982).

Since 1970, bryophyte exploration of northeastern and southern Yunnan has been carried out by members of the Kunming Institute of Botany, and a bryophyte flora of Yunnan (possibly running to 3 volumes) is being compiled. In addition, a comprehensive exploration of Guizhou Province was recently carried out (Zhong & Jiang, 1983; Lin, 1985). About 5 different expeditions have collected bryophytes on the southern island of Hainan and its bryoflora is now getting better known (Wu & Lin, 1978).

Shortly after the "open-door policy" had been established a series of foreign bryologists came to China, to co-operate with Chinese bryologists in different ways. Andries Touw, the Dutch bryologist, was probably the first to visit the South China Institute of Botany, the Kunming Institute of Botany and the Institute of Botany, Peking. He collected in Xishuanbana, the kingdom of plants in China. Through the Sino-Finnish

Scientist's Exchange Programme, Timo Koponen was the first Finnish bryologist to visit China and he collected on Mt. Changbai in 1981 (Koponen *et al.*, 1983). In 1985 he and his wife and son visited Hainan Island, south China. Based on the Japanese Society for Promotion of the Sciences and the Chinese Academy of Sciences' longterm exchange, Zen Iwatsuki and his wife visited Guangdong, Peking and Shenyang in 1983.

Almost at the same time, Paul Redfearn from Southwest Missouri State University and his wife, started the first of four visits to China. On his first trip Dr. Redfearn stayed at Omei Mt., Sichuan Province, Yunnan and Peking and had a chance to meet most of the Chinese bryologists during the 1983 Chinese bryological meeting for the compilation of the Chinese bryoflora (See *Bryol. Times* 27: 3-5, 1984 - ed.). David Smith, Tennessee University, together with mycologist Petersen, has collected in southern and north-western Yunnan three times since 1983, in co-operation with the Yunnan Institute of Botany.

The largest undertakings for collecting vascular plants and mosses have been the Sino-American Expeditions to Hubei Province, central China, north-western Yunnan and Guizhou Provinces in 1976, 1984 and 1986. The third and last party included Paul Redfearn, Marshall Crosby and Robert Magill, from the Missouri Botanical Garden, and five Chinese bryologists. The collection localities (Dec. 1986 - Jan. 1987) included Xishuangbana, southern Yunnan and Mt. Dinghu (Lin *et al.*, 1982) and Mt. Luofu in Guangdong Province.

Following the "Iconographia Cormophytorum Sinicorum" (Institute of Botany, Academia Sinica, etc., 1972) and the "Bryoflora of Xizang" (Li *et al.*, 1985), a sister bryoflora of the "Hengduan mountains" area will be completed in 1988. Most

of the Chinese bryologists are also working seriously on volumes I and III of the "Bryoflora of China".

In 1986, the Chinese Academy of Sciences decided to give a special award to the "Genera Muscorum Sinicorum" (Chen, 1963, 1978). The late professor P.C. Chen was editor in chief of this work and volume II was only published ten years after his death.

The above report shows that following the "open-door policy" of China, co-operative international support bryological exploration in China is steadily increasing. We sincerely hope that a new bryological epoch in China is dawning.

References

- CHEN, P.C. [1962]. *The bryophytes of Qomolangma region*. Report on the Scientific Expedition of Qomolangma Region. Peking, Science Press: 215-239 (in Chinese).
- CHEN, P.C. (ed.) [1963]. *Genera Muscorum Sinicorum I*. Peking, Science Press (in Chinese).
- CHEN, P.C. (ed.) [1978]. *Genera Muscorum Sinicorum II*. Peking, Science Press (in Chinese).
- GAO, C. [1982]. Studies on the bryophyta of north-east China. *Journ. Hattori Bot. Lab.* 52: 287-293.
- GAO, C. & G.C. ZHANG [1981]. *Flora Hepaticarum Chinae Boreali-Orientalis*. Peking, Science Press.
- GAO, C., M. ZHANG, G.C. ZHANG, X.J. LI & S.Y. ZENG [1981]. On the geographic distribution of mosses in Xizang Plateau and its floristic analysis. *Geol. Ecol. Stud. Qinghai-Xizang Plateau. II*. Peking, Science Press: 1189-1197.
- Institute of Botany, Academia Sinica etc. [1972]. *Iconographia Cormophytorum Sinicorum, Tom. I*. Peking, Science Press: 1-106.
- Institute of Forestry and Pedology, Academia Sinica [1977]. *Flora Muscorum Chinae Boreali-Orientalis*. Peking, Science Press.
- KOPONEN, T. [1984]. A historical review of Chinese bryology. Proceedings of the third meeting of the bryologists from Central and East Europe, Praha. *Praha, Univ. Karlova*: 283-313.

continued over

Exploration in China, continued

- KOPONEN, T., C. GAO, J.S. LOU, & I. JÄRVINEN [1983]. Bryophytes from Mt. Chang-Bai, Jilin Province, north east China. *Ann. Bot. Fennici* 20: 215-232.
- LI, X.J. [1981]. Study on the geographical distribution and bryofloral elements of Pottiaceae from Xizang. *Geol. Ecol. Stud. Qinghai-Xizang Plateau. II*. Peking, Science Press: 1199-1207.
- LI, X.J. [1985a]. The floristic characteristics of the Pottiaceae in the Mt. Nam-jagbarwa region. *Mountain Res.* 3(4): 317-320.
- LI, X.J. [1985b]. *Bryoflora of Xizang*. Peking, Science Press.
- LIN, P.J., Y.Y. YANG, & Z.H. LI [1982]. A study on the bryophytes of Ding-Hu Shan. *Trop. Subtrop. For. Ecosys.* 1: 58-76.
- LIN, Q.W. [1985]. *A preliminary report on the bryophytes in Kuankuoshui forest region, Guizhou Province*. Scientific Survey of the Kuankuoshui forest area. Guizhou People's Press: 152-156. (in Chinese).
- LOU, J.S. & M.Z. WANG [1983]. *The mountains Hengduan, the distributional centre for east-Asiatic Porellaceae (Hepaticae)*. The study of Qinghai-Xizang (Tibet) Plateau. Special issue of the investigation on Hengduan Mts. I. Yunnan People's Press, 270-279.
- LOU, J.S. & M.Z. WANG [1986]. *A preliminary report on some endemic genera and a new record of bryophytes of the Hengduan Mountains*. The study of Qinghai-Xizang (Tibet) Plateau. Special issue of the investigation on Hengduan Mts. II. Peking, Science and Technology Press, 442-452.
- LOU, J.S., P.C. WU & P.J. LIN [1983]. A preliminary analysis of the Hepaticae flora in Xizang (Tibet). *Bot. Res.* 1: 31-40.
- WANG, C.W. [1935]. The research and its literature on bryophytes in China. *Chinese Bot. Mag.* 4: 415-427 (in Chinese).
- WU, P.C. [1984]. Fifty years of Chinese bryology. *Journ. Hattori Bot. Lab.* 56: 29-38.
- WU, P.C. & P.J. LIN [1978]. A preliminary observation on the Hepaticae of the Island Hainan, China and their phytogeographical relationships. *Acta Phytotax. Sin.* 16(2): 56-71.
- WU, P.C. & J.S. LOU [1981]. The characteristics and possible origin of the bryoflora of the southern flank of the east Himalayas. *Proc. Symp. Geol. Ecol. Stud. Qinghai-Xizang, II*: 1179-1183.
- XU, W.X. & R.L. XIONG [1980]. Study on the taxonomy, distribution and bryoflora of Polytrichaceae in Xizang (Tibet). *Proc. Symp. Qinghai-Xizang (Tibet) Plateau*: 151-152.
- ZENG, S.Y. [1984]. A preliminary analysis on the geographical distribution and bryofloral elements of Thuidiaceae from Xizang (Tibet). *Bul. Bot. Res.* 4(3): 119-127.
- ZHANG, M.X. [1974]. The vertical distribution and phytogeography of the bryophytes of the northern flank of Taibai Mt., Shannxi Province. *Bot. Res.* 3: 1-9 (in Chinese).
- ZHANG, M.X. [1982]. The taxonomy of Chinese Leucodontaceae. *Acta Bot. Bor. Occ. Sin.* 2(1): 18-27.
- ZHONG, B.G. & S.Z. JIANG [1983]. The preliminary investigation on the bryophytes of Mt. Fan-Jing. *Guizhou Forestry Technology (Guizhou Linze Keji)* 4: 10-37.

Institute of Botany
Academia Sinica, Peking
People's Republic of China

Stanley Greene, continued

the University of Reading. After his move to The Netherlands he was to be reassociated with the British Museum (Natural History) as honorary officer.

In the earlier part of his career Stanley became known by his pioneering work on the ecology of the life cycle of mosses - the "maturation cycle" as he called it - and together with his co-workers (e.g. Royce Longton) he helped founding the field of reproductive ecology of bryophytes. He was, moreover, actively engaged in explorations and research in the Antarctic and edited numerous publications on the botany of that part of the world. A born raconteur, Stanley could entertain you for lengths of time with his experiences and adventures in these harsh en-

vironments and indeed with anecdotes from all over the world.

In 1966 Stanley attended the Pacific Science Congress in Tokyo where he helped to start up the International Association of Bryologists. Together with Bill Steere (president) and Zen Iwatsuki he became a member of the first executive committee and he remained in council until in 1987 he was elected the fourth president of the I.A.B. Within this organization Stanley was an initiator and a driving force behind innumerable undertakings of the Association, notably the *Advances in Bryology*, the taxonomic workshop in Geneva and the *Conspectus of Bryological Taxonomic Literature* and *The Bryological Times*. Of all these ventures he was a fervent supporter and it would be difficult to single out one closer to

his heart than the others.

The *Conspectus* has the longest history, which may be recalled here. It was launched at Stanley's initiative as an I.A.B. project in the early seventies. It coincided with a turn in his activities from fieldwork and exploration to taxonomic documentation, which had also been one of his early interests. His involvement in that area of research is evident from e.g. his very useful paper in the *Festschrift for Geneva Sayre*: "Retrieval works useful to the bryological taxonomist" (*Occ. Pap. Farlow Herb. Vol.* 16: 83-99. 1981). When he announced his *Conspectus* project many colleagues from all over the world responded enthusiastically and provided long lists of literature on regional bryophyte floras. A huge pile

continued over

Stanley Greene, continued

of data resulted! While many (including myself) eventually became sceptical whether the work could ever be published, Stanley, with the help of Alan Harrington and of several technical assistants, continued working on the project with unfailing enthusiasm even in the face of ups and downs – and ups – in his personal affairs, to produce a book in two volumes the second of which appeared only weeks before his death. A truly marvellous work which for years will be on our desks as a major source of scientific information.

Stanley and I were bound together by our common interest for almost twenty years. During those years I have profited enormously from his example and advice on numerous occasions. At times when I doubted the value or purpose of certain undertakings, Stanley would be quick to emphasize the positive aspects of the work and would inspire me through his wisdom and experience. He was a man of strong opinions – too strong, at times, for some – but his opinion was always supported by information and, first and foremost, was caused by a genuine interest in the subject at hand. I feel privileged to have been his friend. Stanley will be remembered for his professionalism, for his unfailing enthusiasm and, above all, for his warm personality.

S. Rob Gradstein
Institute of Systematic Botany
Heidelberglaan 2, 3584 CS Utrecht
The Netherlands

Cryptoleptodon flexuosus (Harv.) Ren. & Card. a “rolling” moss from the Kumaun Himalaya

by

Giribala B. Pant & S. D. Tewari



Twig of a shrub
wrapped-up with
intertwined
hanging shoots of
Cryptoleptodon
flexuosus.

The familiar sight of a “rolling” moss, *Cryptoleptodon flexuosus* (Harv.) Ren. & Card. (Neckeraceae), is a striking feature of the Kumaun Himalayan woodland and forest landscape. Its habitat varies from epiphytic to epilithic to epipaedic and this switching over of habitats is easily achieved by its “rolling” nature. We call it a “rolling” moss because irregular, wind-swept fragments of varying sizes are often scattered over forest floors, forest soils, road sides and walls especially in summer months (May – June).

Loose tufts of this pleurocarp – a Himalayan species – are commonly seen hanging in festoons or in other grotesque shapes (see photo) from trunks of oak (*Quercus floribunda* (Lindl.) Rehder or *Q. leucotri-*

chophora A. Camus ex.), conifers (*Cedrus deodara* (Roxb.) Louden, *Cupressus torulosa* Don.) and shrubs (*Arundinaria falcata* Nees., *Berberis asiatica* Roxb., *Daphane papyracea* Wall., *Desmodium elegans* DC., *Myrsine africana* Linn., *M. semiser-rata* Wall. and *Smilax aspera* Linn.). Parts or fragments of these lax tufts get detached from their original epiphytic habitat or lodging place in a tree and are blown away by strong winds. The flexuose, pendant branches of the secondary shoots become extremely light in the dry state, curl back circinnately and whole shoots can easily be blown fairly long distances. Whatever substrate they land on, given favourable conditions, the moss starts regenerating

continued over

Cryptoleptodon flexuosus, contd.

and new growth commences. If the intertwined fragments land on tree trunks or branches, the moss goes on to colonize their bare surfaces and ultimately reaches such luxuriant expansion of large, loose tufts hanging down from host trees. Broken parts of *C. flexuosus* tufts, falling on the shrubby understorey of the oak forests, also display a pendulous growth-form and can be seen dangling, from twigs and slender branches of many shrubs and even from the crowded culms of the tufted shrubby reed-like Himalayan bamboo, *Arundinaria falcata* Nees. The native name of this bamboo is Ringal.

If the moss fragments fall upon craggy rocks or stony walls, luxuriant dimensions are not attained as the moss fails, in these habitats, to produce prolific secondary branches. However, on humus-laden rock-overhangs, it forms large triangular masses – the much branched secondary shoots hanging downwards and the primary ones with a humus core remaining adherent to the substratum.

We have observed this moss fruit infrequently. The transport of fragments by wind or birds is probably its common method of dispersal. This is in accordance with Richards' (1984, p. 1242) remark that "many, perhaps all hanging mosses produce capsules rather infrequently; the transport of fragments by winds and birds is probably their normal method of dispersal".

We have also analysed some birds' nests with bryophyte material incorporated in them collected from Naini Tal and environs (alt. 1600 – 2500 m), and found that *C. flexuosus* formed part of the outer covering of the miniature basket along with other liverworts and pleurocarps. The dried-up primary creeping stems and the flexuous, pendant, secondary branches of the *Cryptoleptodon* can be easily stripped off their substratum by the birds' beak. It is not sur-

Taxonomic problems of mosses in Antarctica

by

Hiroshi Kanda

A contribution to the Taxonomy Column, edited by D.H. Vitt (Mosses)

Bryological studies in the Syowa Station area, Enderby Land, Continental Antarctica began with work by Horikawa and Ando (1961) based on specimens collected during the International Geophysical Year (IGY), 1957-58. They reported three species of mosses already known from Antarctica, *Ceratodon purpureus*, *Bryum argenteum*, and *B. inconnexum*; one species new to science – *B. ongulense*, and one new variety – *B. inconnexum* var. *fragile*.

All of these taxa showed considerable variation in morphological characters. Some leaves of *Ceratodon purpureus* tended to be somewhat short and obtuse without serration, states which are rather exceptional in temperate latitudes. Variation in the leaf characters of this species was studied in culture by Kanda (1979). In liquid culture at temperatures less than 15°C, leaves of new shoots were larger and somewhat reflexed with acute apices. However, in agar culture under the same conditions, leaves developed more poorly and were usually straight with rather round apices. On the other hand, in darkness under the same conditions, new shoots were smaller, with loosely arranged whitish leaves. This thinner shoot form with poor foliation resembled the

slender basal part of branches seen in wild Antarctic plants and results from initial shoot development under the dark conditions of early summer.

The characteristic features of the Antarctic *Bryum ongulense* and *B. inconnexum* var. *fragile*, are few radicles, very fragile, smaller, narrower leaves, and flagelliferous stem growth. It seems clear to me that the less divergent, round leaves and flagelliferous stem growth that are specific to Antarctic plants are phenotypic and have not been fixed genetically. Horikawa and Ando (1967) were inclined to regard both of these taxa as morphological variants of *B. inconnexum*, while Ochi (1979) treated them as synonyms of *B. pseudotriquetrum*.

Antarctic *Bryum argenteum* is another morphologically variable species, Horikawa and Ando (1961) having described the characteristics of *B. argenteum* from the plants growing around Syowa Station. These plants were diploid with $n=20$, according to following Tatuno's (1963) study. They suggested that it may be more appropriate to treat them as a variety or even as a separate species. Fifteen years after this study, *B. argenteum* of haploid ($n=10$) level was collected in the Syowa

continued over

prising that the birds do this since one bird can lift a good quantity of the light-weight material at a time, and it is available in profusion (Pant and Tewari, 1984).

References

PANT, G.B. & S.D.I. TEWARI [1984]. Birds gather bryophytes for nest build-

ing. *Phyta* 4(5): 57-60.

RICHARDS, P.W. [1984]. The ecology of tropical forest bryophytes. In Schuster, R. M. (ed.). *New manual of bryology*, Vol. II. Nichinan. The Hattori Botanical Laboratory: 1233-1270.

Kumaun University, D.S.B. Campus
Dept. of Botany, Bryology Laboratory
Naini Tal 263002, India

Mosses in Antarctica, continued

Station area (Inoue, 1976, Nakanishi, 1977). As a result, the *Bryum argenteum* plants with $n=20$ can be considered a cytotype of *B. inconnexum* (Horkawa and Ando, 1967).

Although *B. argenteum* has been recorded through out the Antarctic, detailed morphological descriptions from each locality are lacking. Seppelt and Kanda (1986) discussed the potential for variation in Antarctic species of *Bryum*. While *B. argenteum* has been positively determined from Continental Antarctica, specimens from the Vestfold Hills and Knox Coast were assigned to another species – *B. pseudotriquetrum*. They also reconfirmed the identification of many specimens previously determined as *B. argenteum*. In many *B. pseudotriquetrum* plants, the stem leaves showed physical damage near their apex, resulting in the presence of hyaline cells and consequent confusion with *B. argenteum*. The apical part of the leaf, particularly that of the upper stem leaves, is often badly broken and in many specimens from drier habitats there is often fungal development on these damaged leaves. However, in Antarctica, leaf shape should readily distinguish *B. argenteum* from even the smallest form of *B. pseudotriquetrum* with which it has often been confused.

Seppelt and Selkirk (1984) demonstrated that deciduous shoots of *B. argenteum* cultured at 4°C produced new shoots with ecostate, rounded orbicular leaves with all cells chlorophyllous, while at 21°C the leaves developed a costate, hyaline and acute apex and resembled typical leaves of specimens from temperate latitudes. Other studies on climatic adaptation of bryophytes have been carried out with particular reference to Antarctic regions (Longton, 1974, 1979, 1981, 1982; Longton and MacIver, 1977). Some features of the leaves of *Polytrichum strictum* exhibit genecological differentiation which has

been shown through clone culture to be topoclinal adaptation (Longton, 1974). Characters of leaves of *Bryum argenteum* collected at several distinct latitudes could be related to the original field population (Longton, 1981). Thus, the considerable variation in morphological features of Antarctic mosses is one of the important aspects in the interpretation of intra-specific differentiation.

Ochi (1979) recognized two species of *Bryum*, *B. pseudotriquetrum* and *B. argenteum*, from the Syowa Station area. In the specimens tentatively named *B. pseudotriquetrum*, the vegetative leaves were characterized by a decurrent base and peculiar serrulation in the uppermost part of the leaf. Using these features, all bryaceous species occurring in the Syowa Station can be determined as *B. argenteum*, *B. algovicum*, *B. amblyodon* or a synoicous form of *B. pseudotriquetrum*. Kanda and Ochi (1986) reported a fruiting plant from Syowa Station area, which was assigned to *B. amblyodon*. This paper together with Ochi and Ochyra (1985) and Ochyra and Ochi (1987) added four species to the Maritime Antarctic flora, namely, *B. amblyodon*, *B. dichotomum*, *B. orbicularifolium* and *B. urbanskyi*. Therefore it is possible that several more species may be added to the bryaceous flora of Continental Antarctica, including the Syowa Station area.

Kanda (1981) excluded *Bryum antarcticum* Hook. f. et Wils. from the Bryaceae and considered it synonymous with *Pottia heimii* (Hedw.) Hampe. Earlier, Nakanishi (1977) had determined the specimens of this species from the Syowa Station area as *B. antarcticum*. He mentioned that the capsule had no peristome teeth and that it had a lid connected to the columella. However, the vegetative leaves have, apparently, smooth cells. Leaf cells with C-shaped or rounded papillae are characteristic of *Pottia heimii* but these have never

been seen in specimens from the Syowa Station area. It is necessary for the morphological variation of *Pottia heimii* to be analyzed from a global viewpoint including the specimens from polar regions.

One reason why mosses endemic to Antarctica or those that are found predominantly in the Antarctic are very scarce may be that collection of these mosses is insufficient. Due to logistic problems, bryological studies have been carried out on a very local basis along the coastal ice-free areas of Continental Antarctica and it is possible that moss floras in other ice-free zones are locally distinctive. For example, it is likely that species such as *Bryoerythrophyllum recurvirostre*, *Sarconeurum glaciale*, *Grimmia antarctici* and *Cephalozella exiliflora* that occur in Wilkes Land next to Enderby Land will be found in the Syowa Station area.

In contrast to the moss flora of the Maritime Antarctic that is affected by latitudinal changes, that of Continental Antarctica changes longitudinally. The Maritime Antarctic has more than 100 bryophyte species in comparison to the 20 or so species known from Continental Antarctica. However, the taxonomic treatment of mosses in Continental Antarctica is no less confusing than in the Maritime Antarctic.

It is essential that good, well-developed specimens are collected by specialists and that sexual and sporophytic material is obtained if at all possible. Ecological remarks should accompany all samples and laboratory cultures are desirable for all taxa.

References

- HORIKAWA, Y. & H. ANDO [1961]. Mosses of the Ongul Islands collected during the 1957-60 Japanese Antarctic Research Expedition. *Hikobia* 2: 160-169.
- HORIKAWA, Y. & H. ANDO [1961]. The mosses of the Ongul Islands and adjoining coastal areas of the Antarctic

continued over

Mosses in Antarctica, continued

Continent. *JARE Sci. Rep., Spec. Issue* 1:245-252.

INOUE, S. [1976]. Chromosome studies on five species of Antarctic mosses. *Kumamoto J. Sci. Biol.* 13(1): 1-5.

KANDA, H. [1979]. Regenerative development in culture of Antarctic plants of *Ceratodon purpureus* (Hedw.) Brid. *Mem. Natl. Inst. Polar Res., Spec. Issue* 11: 58-69.

KANDA, H. [1981]. Two moss species of the genus *Pottia* collected from the vicinity of Syowa Station, East Antarctica. *Antarct. Res.* 71: 96-108.

KANDA, H. & H. OCHI. [1986]. Fruiting plants of *Bryum* found in the vicinity of Syowa Station, Antarctica. *Mem. Natl. Inst. Polar Res., Spec. Issue* 44: 220-228.

LONGTON, R.E. [1974]. Genecological differentiation in bryophytes. *J. Hattori Bot. Lab.* 38: 49-65.

LONGTON, R.E. [1979]. Studies on growth, reproduction and population ecology in relation to microclimate in the bipolar moss *Polytrichum alpestre*. *Bryologist* 82(3): 325-367.

LONGTON, R.E. [1981]. Inter-population variation in morphology and physiology in the cosmopolitan moss *Bryum argenteum* Hedw. *J. Bryol.* 11: 501-520.

LONGTON, R.E. [1982]. The biosystematic approach to bryology. *J. Hattori Bot. Lab.* 53: 1-19.

LONGTON, R.E. & M.A. MACIVER. [1977]. *Climatic relationships in Antarctic and Northern Hemisphere populations of a cosmopolitan moss, Bryum argenteum Hedw.* In Llano, G. A. (ed.) *Adaptation within Antarctic Ecosystems*, Washington, D.C., Smithsonian Inst., 899-919.

NAKANISHI, S. [1977]. Ecological studies of the moss and lichen communities in the ice-free areas near Syowa Station, Antarctica. *Antarct. Rec.* 59: 68-96.

OCHI, H. [1979]. A taxonomic review of the genus *Bryum*, musci in Antarctica. *Mem. Natl. Inst. Polar Res., Spec. Issue* 11: 70-80.

OCHI, H. & R. OCHYRA [1985]. *Bryum dichotomum* Hedw., a species new to the Antarctic. *Lindbergia* 11: 157-160.

OCHYRA, R. & H. OCHI [1987]. New or otherwise interesting species of the genus *Bryum* (Musci, Bryaceae) in the
continued over

Progress in nomina conservanda et rejicienda

by

Gea Zijlstra

A contribution to the Nomenclature Column, edited by G. Zijlstra

I. The Berlin Code

As some of you may have noticed the Berlin Code appeared with several bryophyte names added in Appendix III: *Acrolejeunea*, *Calypogeia*, *Lopholejeunea* and *Trachylejeunea* [all H]. In addition, another type paragraph was given in *Lejeunea* and in *Pellia*. Besides several correction of details, two groups of changes occurred: 1] deletion of *orth. rej.* entries and 2] deletion of a number of *typ. cons.* notations. The latter will be subject of a future column; for the former a short explanation will do.

In Sydney it was decided that only one orthographical variant of a name is treated as validly published (Art. 75.1). The remaining variants no longer exist, i.e. they are to be treated as having been published in the correct form of the name (Art. 75.3). This has effects in the Appendix of the Code. In the Sydney Code no new (V) entries were included and *orth. cons.* names were entered in a new format. Now, in the Berlin Code, the existing variant names have been corrected by changing the left hand entry, adding "(*orth. cons.*)", and deleting the (V) right hand entry.

In Appendix II the entry of *Lophozia* was deleted (conservation redundant since the Sydney change in Art. 10).

II. After Berlin

Because the new Code was produced so quickly several names that had been conserved following the actions of the Committee for Bryophyta could not be included in the List of Nomina Conservanda. Therefore I think it might be helpful to inform you of the present state of several proposals.

In April 1987 the Committee for

Bryophyta accepted the proposals to conserve *Jubula* Dum. 1822 (amended: with type *J. hutchinsiae* (W.J. Hook.) Dum., *typ. cons.*: no rej. entry [H]), *Taxilejeunea* (Spruce) Schiffn. 1893 (amended: with type *T. chimborazensis* (Spruce) Steph.: with *Taxilejeunea* Steph. 1889 *nom. rej. prop.*) [H]), *Callicostella* (Müll. Hal.) Mitten 1859 (with *Schizomitrium* Schimp. 1851 *nom. rej. prop.*) [M] and *Rhodobryum* (Schimp.) Limpr. 1892 (with *Rhodo-Bryum* Hampe 1874 *nom. rej. prop.*) [M].

In January 1988, the Committee for Bryophyta accepted proposals to conserve *Mannia* Opiz 1829 (amended: with type *M. androgyna* (L.) Evans; with *Cyathophora* S.F. Gray 1821 *nom. rej. prop.*) [H] and to correct the present *Papillaria* entry as proposed: *Papillaria* (Müll. Hal.) Lorentz 1864 (with *Papillaria* J. Kickx fil. 1835 *nom. rej. prop.*) [M].

What is the present state of these proposals?

Acceptance by the Committee implies that they went through the stage of discussion, and that the Committee for Bryophyta has recommended them to the General Nomenclature committee to be officially accepted (after publication of the report in *Taxon*, 1989). The final decision on the proposals will be taken by the nomenclature section of the International Botanical Congress, 1993. As a rule the General Nomenclature Committee accepts the proposals made by the Special Committees. An illustration: in December 1987 I was asked (as a member of the General Committee) to vote on three reports concerning a total of 86 proposals! Two of these reports had not yet been published but the legal procedure
continued over

Progress nom. cons. rej., contd.

was put to one side in order to get the data, with asterisks, into the Berlin Code. The final approval by the Congress thus appears to be a mere formality and final acceptance of the above-mentioned bryological proposals in Tokyo can therefore be expected.

With respect to the remaining proposals the situation is as follows:

1] *Mnium trichomanis*, *Mnium fissum* and *Lethocolea* are up for voting in 1989, 2] *Grimmia alpicola* is in a final stage of discussion (discussion was necessary again since Berlin changed Art. 69), 3] *Haplocladium* has been withdrawn (more on this next time) and 4] Fossombro-niaceae have just entered the discussions.

Institute of Systematic Botany
Heidelberglaan 2, 3584 CS Utrecht
The Netherlands

Mosses in Antarctica, continued

Antarctic. *Acta Bot. Acad. Sci. Hung.*
(in press).

SEPPELT, R.D. & H. KANDA [1986]. Morphological variation and taxonomic investigation in the moss genus *Bryum* in Antarctica. *Mem. Natl. Inst. Polar Res., Ser. E* 37: 27-42.

SEPPELT, R.D. & P.M. SELKIRK [1984]. Effects of submersion on morphology and the implications of induced environmental modification on the taxonomic interpretation of related Antarctic moss species. *J. Hattori Bot. Lab.* 55: 273-279.

TATUNO, S. [1963]. Zytologische Untersuchungen über die Laubmoose von Antarktis. *Hikobia* 3: 268-274.

National Institute of Polar Research
9-10, Kaga 1-chome, Itabashi-ku
Tokyo 173, Japan

International Symposium on Bryophyte Ecology, Edinburgh, July 1988

An international symposium on Bryophyte Ecology, sponsored by the British Bryological Society and the British Ecological Society (Production and Decomposition Ecology Research Group), was held at Pollock Hall, University of Edinburgh, Scotland, from 19-22 July 1988. The programme was organized by Dr R.E. Longton and the excellent local arrangements were made by Dr D.J. Lightowlers. Approximately 75 bryologists participated, including more than 40 based outside the United Kingdom.

Following an address of welcome by Prof. John McNeill, Regius Keeper of the Royal Botanic Garden, Edinburgh, the programme on 19 July comprised two sessions of invited papers on the themes of Bryophyte Production and Decomposition and Interaction between Bryophytes and other Organisms. In the former, S. Russell (Rhodes University, South Africa), D.H. Vitt (Edmonton, Canada) and J.-P. Frahm (Duisburg, West-Germany) considered aspects of bryophyte productivity and polar, boreal forest and tropical ecosystems respectively and M.C.F. Proctor (Exeter, UK) discussed the physiological basis of bryophyte production. In the second session A. Koponen (Helsinki, Finland) gave an account of entomophily in the Splachnaceae, and bryophytes were considered in relation to nutrient cycling by D.H. Brown (Bristol, UK), interactions with other plants by H.J. During (Utrecht, The Netherlands), and herbivory by A.J. Davidson (Reading, UK).

The second day, July 20, was given over to a series of eight contributed papers and the presentation of fourteen posters on topics ranging from the BBS computerized mapping scheme (M.O. Hill, Monks Wood, UK) to isozyme banding and popula-

tion structure in *Sphagnum* (R.E. Daniels, Furgebrook, UK) and the effects of fertilization on the growth of *Calliergon cuspidatum* in Dutch chalk grassland (B.F. van Tooren, Utrecht, The Netherlands).

On July 21 there were two further sessions of invited papers. On the theme Population Biology, bryophytes were discussed in relation to ecological niche theory by N.G. Slack (Troy, NY, USA) and plant strategy theory by J.P. Grime (Sheffield, UK), while R.E. Longton (Reading, UK) reviewed evidence on the role of spores in the reproduction of mosses and M.E. Newton (Manchester, UK) spoke on the genetic structure of hepatic species. On the second theme, Bryophytes and Man-Modified Ecosystems, M.A.S. Burton (MARC, London, UK) reviewed the use of bryophytes as monitors of environmental contaminants while G. Tyler (Lund, Sweden) considered more specifically bryophytes and heavy metals and J.A. Lee (Manchester, UK) assessed the responses of bryophytes to mineral deposition. Finally D. Norris (Arcata, California, USA) described the effects of forest disturbance on tropical bryophytes.

The weather was not good on July 22 but most participants nevertheless enjoyed a field excursion to Roslin Glen and other interesting sites in the Edinburgh area, and many subsequently travelled to Inverness for the summer field meeting of the BBS. The invited papers presented at the symposium will be published during 1989 as a issue of the Botanical Journal of the Linnean Society, through the kindness of the Journal's editor, Dr S.C. Jury.

Royce E. Longton
University of Reading, Botany Dept.
Reading, Berkshire RG6 2AS, UK

International conference on experimental bryology and *Sphagnum* biology, Exeter, July 1991

The IAB is to collaborate with the British Bryological Society in arranging meetings on Experimental Biology and on Biology of *Sphagnum* at the University of Exeter in July 1991. It is envisaged that the former will include a one-day field excursion and three days devoted to invited presentations, contributed papers and posters on all aspects of experimental bryology. The *Sphagnum* meeting will begin with a field excursion of approximately five days duration visiting *Sphagnum*-rich sites throughout Great Britain, followed by two days of paper and poster presentations at Exeter on a range of topics including ecology, physiology, systematics, genetics and evolution. The two meetings will be held consecutively in the hope that many bryologists may choose to attend both. Further details will appear in future issues of *The Bryological Times*. Meanwhile suggestions concerning contributions and other relevant matters, and initial expressions of interest in attending (without commitment), should be sent to:

for *Experimental Bryology*

Dr M.C.F. Proctor
The University
Hatherly Laboratories
Prince of Wales Road
Exeter EX4 4PS, UK

for *Biology of Sphagnum*

Dr R.E. Daniels
ITE, Furzebrook Research Station
Wareham, Dorset BH20 5AS, UK

or to:

Dr Diana Horton
University of Iowa
Dept. of Botany
Iowa city, Iowa 52242, USA

The sixth meeting of the Central and East European Bryological Working Group, Sept. 1988: an outsider's impressions

I had never before been to eastern Europe and due to awkward flight schedules and a missed night, I arrived in Prague somewhat disoriented. It was thus a challenge to get the taxi driver, who spoke only Czech, to take me where our bus was waiting in downtown Prague. The taxi ride gave me my first impressions of the city and despite the dreary, drizzling weather, Prague held that Old World charm one sees on postcards. Once on the bus to Libice these impressions continued – a kind of faded glory.

Our lodging and meeting room were in a chateau built around 1500 and managed by the Czechoslovak Academy of Sciences. To an American, coming from a country where anything that old is likely to only be a crumbling fort, it was most impressive. My large room had a high ceiling and a balcony. After unloading our baggage, the only other American, Cyrus McQueen and his family, and I roamed the spacious chateau and marvelled at the architecture and interior design. By that time the other participants were settling in and it was good to see old friends and meet others only known from the literature and correspondence. About 50 scientists attended the meeting. Czechoslovakians and colleagues from East Germany were the most numerous, but also in attendance were representatives from Poland, Hungary, the Soviet Union, West Germany, Spain, Finland, Sweden, The Netherlands, Belgium, Luxembourg, Israel and the United States. Although I couldn't complain, it seemed odd that English was the official language of the meeting even though only two of us there had English as a native language. However, most participants spoke English fairly well and our gracious organizer, Tomas Herben, spoke it al-

most flawlessly.

The paper sessions began with an opening address, in German, by Dr. S. Hejny, Director of the Botanical Institute of the Czechoslovak Academy of Sciences. Afterwards I, as the only Council member of IAB, gave our greetings to the CEBWG. Stanley Greene who was unable to be present had earlier telephoned me from England and asked me to say a few words. I was quite literal, and after about 15 seconds I sat down – at first there was an astonished silence, and then smiles and applause. The scientific program was divided into four sessions: Bryogeography and Floristics, Bryophytes in the Changing World, Ecology and Sociology, and Taxonomy. Overall, the papers were quite good, and primarily centered on European bryophytes although a few were on extra-European topics. The presentation of Prof. Piotr Szmajda was an excellent example of the multilingual, multicultural nature of the meeting: he gave a talk in Russian, showed slides in English, and answered questions in French!

However, it was not the papers that were the highlight of the meeting, but rather the extracurricular activities. Every evening we sat in the dining room until the early hours of the morning, surrounded by bottles of Czech beer, and although discussions usually started out on bryology, they always ended up on politics. Everyone was interested in the political situation in other countries. Most memorable was a slide show one evening by Vrege Manakyan on activities current in Armenia.

Although the evening sessions went on every night, the papers occupied only two days, September 13 and 14. On Thursday, the 15th, we were all loaded on buses for the first

continued over

Request for information on grant supported bryological research projects

by Diana G. Horton
Editor, *Bulletin of Bryology*

I would like to request that anyone who currently has grant support for research on bryophytes forwards an abstract of the research project, name of the granting agency and time period covered by the grant to me. This information will be published in the *Bulletin of Bryology*. I believe that including such information in the *Bulletin* accords well with its purpose to communicate, not only to bryologists, but also to other botanists, about international bryological activities, and to enhance the image of bryologists and bryological research. A review of grant-supported projects will draw attention to the fact that research on bryophytes is supported by funding agencies and will highlight some of the innovative approaches that are being incorporated into bryological research. Your support of this request is very much appreciated!

The Bulletin of Bryology is edited for the International Association of Bryologists by Diana G. Horton and is published twice a year in *Taxon*. Members who do not receive *Taxon* personally and/or do not have it in their institutional library can obtain a free copy of issues beginning with *Bulletin* XXI (*Taxon* 35, 1986) from the Editor at the following address: Diana G. Horton, Dept. of Botany, University of Iowa, Iowa City, Iowa 52242, USA. Copies of issues of the *Bulletin* published prior to number XXI can be obtained from the Secretary of I.A.B., Dale H. Vitt, Dept. of Botany, University of Alberta, Edmonton, Alberta, Canada T6G 2E9.

Bryol. Working Group, contd.

of two days of field trips. The first site was a sandstone locality along a river. Mostly people just walked along the road, casually looking at bryophytes, and socialized like on most American bryological forays. These occasions are always worthwhile since they give scientists a chance to get to know each other as people, thus strengthening scientific collaboration. After lunch we visited another sandstone area, near the East German border, that had a very different flora. The next day we had the option of another day of field work or a sightseeing tour of Prague. Never having been to Prague before, I shamelessly abandoned any scientific pretext and went there. Here, our small group (most participants chose more field work) was given a delightful and informative tour of some of the old sections of Prague. The ancient synagogues and cathedrals were magnificent and one could not help but be impressed by the massive quantities of stained glass. Because of the short amount of time and the amount there was to

see, we finished our sightseeing with tired legs but dazzled eyes and a desire to revisit the beautiful city.

The final night was our farewell dinner. Riclef Grolle spoke for the whole group and thanked our host, Tomas Herben, for the superb job he had done in organizing our meeting. Then there was a slight delay in indulging our glutinous tendencies because the dining staff had neglected to provide plates! However, this deficiency was soon remedied and we tore into the lavish buffet. Once again, the festivities continued past the midnight hour – this time fueled by the knowledge that it would be our last night together.

Although the group disbanded the next mornig, we left with warm memories of friendship and co-operation. It was decided that the next meeting will be in the Soviet Union but a specific city and date are left open.

William R. Buck
New York Botanical Garden
Bronx, New York, 10458-5126, USA

Book Reviews

Advances in Bryology Volume 3 Bryophyte Ultrastructure

N.G. Miller (ed.): J. Cramer, Berlin, Stuttgart, 1988. viii+282 pp., illustr., hardcover, DM 120.00. At a discount for I.A.B. members.

This new volume of the advances in Bryology shows that bryophytes are excellent objects for study of plant morphogenesis and evolution at the ultrastructural level. The subject is discussed in six chapters, resp. dealing with the bryophyte skeleton, plastids, the blepharoplast, peristomes sporogenesis and the sporophyte-gametophyte junction. Doonan

and Duckett review the impact of recent innumnological and EM work on the role of the cytoskeleton in bryophyte morphogenesis. Fluorescence microscopy has revealed the presence of numerous microfilaments in moss protonemata, and the authors predict finding these to be the force-generating elements responsible for many organelle movement and shaping processes in bryophytes. Duckett and Renzaglia demonstrate that plastid ultrastructure of bryophytes follows developmental courses very different from those in higher plants; moreover, thylakoid structure varies greatly among different taxa and certain arrangements are reminiscent

continued over

Announcements

New editor for *The Bryological Times*

During the I.A.B. meeting at St. Louis, S. Rob Gradstein was appointed as the new general editor of *The Bryological Times*. He will be assisted by Guido B.A. van Reenen, who has the prime responsibility for layout and presentation, and by Paula W.A. Greene, who will take care of the type-setting and language editing. Printing and distribution will as usual take place in and from Edmonton under the responsibility of the honorary secretary of the I.A.B., Dale H. Vitt.

In St. Louis some reshuffling of column editorship took place as well. Janice Glime, the first column editor of *The Bryological Times* and previously responsible for the Techniques Notebook, will start a new column on Ecology. For the Techniques column a new editor is being recruited. Ronald Pursell became the new correspondent for North America, replacing Bill Buck who took over editorship of the Floristics and Phytogeography column from Rob Gradstein.

The Bryological Times will continue to appear every two months. Items for *The Bryological Times* relating to any of the columns listed on the backpage of each issue may as usual be sent to the column editors. All other items shall be directed to the general editor at the address given below. The editor is looking forward to a fruitful collaboration with all those participating in the production of *The Bryological Times* and would welcome any suggestions that might lead to further improvement of the newsletter.

S. Rob Gradstein
editor *The Bryological Times*
Institute of Systematic Botany
Heidelberglaan 2, 3584 CS Utrecht
The Netherlands

Advances in Bryology, contd.

of the Algae.

Spermatogenesis, peristomes and sporogenesis continue to be rewarding subjects for comparative EM work on bryophytes. Carothers and Rushing describe in detail the ultrastructural development of the blepharoplast and report new, phylogenetically relevant variation, especially among the liverworts. Mueller and Neumann demonstrate that differences in ultrastructural and chemical composition of peristome teeth are responsible for the various kinds of hygroscopic movements observed. Brown and Lemmon review in detail the different ultrastructural pathways of sporewall development, which seems to correspond to some extent with the major phylogenetic lines within the bryophytes. The book is concluded by a discussion of the ultrastructural basis of the nutritional relationship between the sporophyte and the gametophyte in bryophytes and the role of "transfer cells" at the interfase of the two generations (Ligrone and Gambardella).

The book is well-produced (paper quality and typography are superior to those used in previous volumes of the *Advances*), richly illustrated with numerous EM pictures of excellent quality, and provided with a useful subject index. The editor and authors are to be congratulated with the publication of this book which will prove to be an indispensable source of information to those interested in the biology of the bryophytes at cellular and subcellular levels.

Bryology: Modern Research and the ways forward

This volume represents the Proceedings of a meeting organized jointly by the BBS and the Linnean society in May 1987. The seven papers by an international team of specialists have been edited by M.E. Newton, P.J. Wanstall and S.L. Jury. Also published in the *Botanical Journal of the Linnean Society* Vol. 98, No. 3, the papers are here brought together as a separate volume which may be obtained from the BBS Librarian, Dr.K.J. Adams, Department of Biology and Biochemistry, North East London Polytechnic, Romford Road, London NE15 4LZ, price #5.50 +postage. The contents are as follows:

- NEWTON, M.E. and P.J. WANSTALL, Preface. Bryology: modern research and the ways forward
SCHUSTER, R.M., The aims and achievements of bryophyte taxonomists
SCOTT, G.A.M., Australasian bryogeography: fact, fallacy and fantasy
SCHOFIELD, W.B., Bryophyte disjunctions in the Northern Hemisphere: Europe and North America
DUCKETT, J.G. and K.S. RENZAGLIA, Cell and molecular biology of bryophytes: ultimate limits to the growth of phylogenetic problems
COVE, D.J. and N.W. ASHTON, Growth regulation and development in *Physcomitrella patens*: an insight into growth regulation and development of bryophytes
LONGTON, R.E., Adaptations and strategies of polar bryophytes
NEWTON, M.E., Chromosomes as indicators of bryophyte reproductive performance

Diary

For explanation of acronyms, see
The Bryological Times 31: 7-8 [1985]

1989

October 21-22

SBLs, Bern, Botanical Institute (Swiss bryophyte mapping project). Taxonomic workshop on Anthocerotae (Irene Bisang) and *Anthelia* (Norbert Schnyder). Further information from Dr. K. Ammann, Syst.-Geobot. Institut, Altenbergrain 21, CH-3013 Bern, Switzerland.

November 25-26

BBS, London. Bryophyte workshop for beginners. Local Sec.: Miss J. Ide, Roehampton Institute for Higher Education, Whitelands College, West Hill, Putney, London, SW15 3SN, UK

1990

April 4-11

BBS, spring field meeting, Lancaster. Loc. Sec.: Mr. Martin Wigginton, Nature Conservancy Council, 70 Castlegate, Grantham, Lincolnshire, UK.

June 26-30

CEBWG meeting Kirovks, USSR. Further information from Dr. N.A. Konstantinova, Polar-Alpine Bot. Garden - Institute Kola Branch, Kirovsk, Murmansk Oblast, USSR.

July 1-7

IV International congress of systematic and evolutionary biology. University of Maryland, College Park, Maryland, USA.

August

BBS, summer field meeting, Ulster: Antrim, Derry and Donegal. Loc. Sec.: Dr. Keith Lewis, Biomedical Library, Queens University, Belfast City Hospital, Lisburn Road, Belfast, BT9 7AB.

August 12-19

Helsinki. Congress of East Asiatic bryology. See *Bryol. Times* 50: 5. Further information from Prof. T. Koponen, Department of Botany, University of Helsinki, Unioninkatu 44, SF-00170 Helsinki, Finland.

Colofon

The Bryological Times, founded in 1980 by Stanley Wilson Greene (1928-1989), is the bimonthly newsletter of the INTERNATIONAL ASSOCIATION OF BRYOLOGISTS. It is published in Edmonton (Canada) and distributed from Edmonton, St. Louis (USA), Beijing (China), Tokyo (Japan) and Eger (Hungary).

All items for publication in *The Bryological Times* are to be sent to the editor, S. Rob Gradstein, Institute of Systematic Botany, Heidelberglaan 2, 3584 CS Utrecht, The Netherlands, **except** those for the regular columns, which should go **direct** to the column editors.

Editor

S.R. Gradstein

Assistant Editors

P.W.A. Greene

G.B.A. van Reenen

Column Editors

Computer Techniques

- J.-P. Frahm, Botanik, Universität Gesamthochschule Duisburg, Postfach 10 16 29, D-4100 Duisburg 1, BRD
- B. O'Shea, 131 Norwood Road, London SE24 9AF, England, UK

Ecology

- J.M. Glime, Department of Biological Science, Michigan Technological University, Houghton, Michigan 49931, USA

Floristics and Phytogeography

- W.R. Buck, New York Botanical Garden, Bronx, New York, 10458-5126, USA
- J. Váňa, Katedra Botaniky, Přírodovědecké Fakulty, Univerzity Karlovy, 128 01 Praha 2, Benátská 2, Czechoslovakia

Nomenclature

- G. Zijlstra, Institute of Systematic Botany, Heidelberglaan 2, 3584 CS Utrecht, The Netherlands

Research and Development

- R. Mues, Fachrichtung Botanik, Fachbereich 16 der Universität des Saarlandes, 660 Saarbrücken, BRD
- J.G. Duckett, Department of Plant Biology & Microbiology, Queen Mary College, University of London, Mile End Road, London E1 4NS, England, UK

Taxonomy

- D.H. Vitt, Department of Botany, University of Alberta, Edmonton, Canada T6G 2E9
- J.J. Engel, Field Museum of Natural History, Roosevelt Road, at Lake Shore Drive, Chicago, Illinois 60605, USA

Tropical Bryology

- C. Delgadillo M., Departamento de Botánica, Instituto de Biología, UNAM, Apartado Postal 70-233, Cd. Universitaria, Del. Coyoacán, 04510 México, D.F. México

For details regarding membership of the INTERNATIONAL ASSOCIATION OF BRYOLOGISTS (currently US \$8.00 p.a.) write to the Honorary Secretary, Dale H. Vitt, Department of Botany, University of Alberta, Edmonton, Alberta, Canada T6G 2E9. All correspondence concerning mailing to Sandi Vitt at the same address.