

INTERNATIONAL

LICHENOLOGICAL

NEWSLETTER Vol. 30, nr. 1, June 1997

Official publication of the
International Association for Lichenology

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ISSN: 0731 - 2830

The opinions expressed in the Newsletter are not necessarily those held by the International
Association for Lichenology.

INTERNATIONAL ASSOCIATION OF LICHENOLOGY

The International Association of Lichenology (I.A.L.) promotes the study and conservation of lichens. It organizes symposia, field trips, and distributes a biannual newsletter. There is a listserver which enables on-line discussion of topics of interest. Webpages devoted to lichenology are also maintained by members of the Association. People wishing to renew their membership in or become members of I.A.L. are requested to send their subscription (\$20 for the biennium 1997-1998, \$ 40 until 2000) to the Treasurers.

The **International Lichenological Newsletter** is the official publication of I.A.L. It is issued twice a year (June and December) in English. By 1997 the Newsletter will be also available on the Internet (addresses will be specified in the next issue). The Newsletter is divided into five main sections: 1) **Association news**: official information concerning the Association, such as minutes of Council meetings, proposals of constitutional changes, new members, changes of addresses, etc. 2) **News**: information about lichenologists, institutional projects, herbaria, requests of collaboration, announcements of meetings, etc. 3) **Reports**: reports of past activities, short lectures, obituaries, short historical novelties, book reviews. 4) **Forum**: discussion of controversial scientific matters. It includes proposals of new themes for discussion (max. 1.5 page), and reactions to former proposals (max. 1 page). When the material will exceed the available space, the Editor will prepare a summary, upon previous agreement of the contributors. 5) **Lichenology on-line**: information on Web sites devoted to Lichens. Any information intended for publication should reach the editor on or before 1 April and 1 October for inclusion in the June and December issues, respectively.

IAL affairs are directed by an Executive Council elected during the last General Meeting. Council members elected at the IAL 3 Symposium (Salzburg, Austria, 1996) are listed below, and will serve until 2000.

I.A.L. EXECUTIVE COUNCIL 1996-2000

President: Hans-Martin Jahns, Botanical Institute, Universitäts-gasse 1, D - 40225 Düsseldorf, Germany.

Vice President: Dianne Fahselt, Dept. of Plant Sciences, University of Western Ontario, London, Ontario, N6A 5B7, Canada.

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ASSOCIATION NEWS

How to pay our dues...

At the general meeting in Salzburg the out-going treasurer drew attention to the greatly increased mailing costs of the Newsletter, which absorbed more money than our income from the membership dues. Fortunately, there were reserves from the past which left the Association's account in credit. At the Vancouver meeting in 1994, it was decided to increase the frequency of payment, which is now due every two years. Are you in order with your dues payments so far (20 US \$ for 1997-1998, or 40 US \$ for 1997-2000)? To avoid excessive banking costs, until the next General Meeting you may simultaneously pay for the two successive terms. Please, pay before 30 June 1997. The following accounts are available: 1) Edit Farkas, Institute of Ecology and Botany, Hungarian Academy of Sciences, H-2163 Vácrátót, Hungary - cheques should be made payable to: Hungarian Foreign Trade Bank, H-1051 Budapest, Szent István tér 11, Acc. no.: 501-00047-2100-4019 MTA "TUDOMANY", as remark please add "IAL membership fee 1997-98 (or 1997-2000)" - All fees should be paid in US dollars! You are kindly requested to add 5 \$ for bank charges if you send a cheque, or in case of bank transfer the sender should pay all bank fees. 2) IAL dues can be also paid to: Francois Lutzoni, Deputy Treasurer, Center for Evolutionary and Environmental Biology, Dept. of Botany, The Field Museum of Natural History, Roosevelt Road at Lake Shore Drive, Chicago, IL 60605, USA.

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Explanation of the fields: name, institute, street, town, country, fax number, e-mail, telephone.

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NEWS

Access to large-scale facility in Helsinki - "Advanced instruction in bryology and lichenology open to postgraduate students"

The Division of Systematic Biology of the Department of Ecology and Systematics, University of Helsinki, was selected in 1994 as a 'Large-scale Facility' by the EU (see the "Bryological Times" no. 79). Aim of the program is to facilitate the mobility of scientists and students between EU countries. Its excellent bryophyte and lichen collections, the Botany Library, the equipment for biomonitoring air pollution effects on lichens and bryophytes were the basis for the decision. Approximately 20 scientists have visited Helsinki through the program so far. The technical audit to evaluate the progress of the program was held on November 22nd, 1996 in Brussels. One of the weak points was the limited participation of postgraduate students. Postgraduate students from EU countries, Iceland, Norway and Switzerland are now being encouraged to participate. This is an excellent opportunity, especially for doing monographic work in any group of lichens or bryophytes, to become acquainted with our collections and libraries, or to use our equipment in pollution studies. Special courses related to lichen taxonomy (Prof. T. Ahti) and bryophyte taxonomy (Prof. T. Koponen, Dr. S. Plippo and Dr. J. Enroth) are currently in progress, and can be joined in at any time. A course on biomonitoring of heavy metal contamination will be held in the autumn of 1997 (Dr. A. Mäkinen), a course on the "Taxonomy and ecology of peatland and aquatic bryophytes" in August 1997, and a course on 'Ecology of epigeic lichens' in May 1997. These courses will be advertised in more detail through Internet. Short visits (1-2 months) can be organized to participate in our current research projects (e.g. "Biodiversity of the bryoflora of tropical SE Asia" and projects on lichen floras of Tierra del Fuego, Newfoundland, Mongolia or other areas). To participate, send an application including 1) curriculum vitae, 2) short research plan of what you aim to do in Helsinki, and, in the case of postgraduate students, 3) a recommendation from your professor. The applications are evaluated by a committee (T. Koponen, T. Ahti, A. Mäkinen, and two foreign experts), and the procedure is quick. Reasonable travel expenses, lodging, and living expenses in Helsinki, as well as those involved in the use

the electron microscope, DNA sequencing, chromatography or atomic absorption spectrophotometry are subsidized by the program. (NB. These funds are not available for Finnish citizens).

Timo Koponen, P.O. Box 7, FIN-00014 University of Helsinki, Finland.

Symposium on lichen systematics at the annual meeting of the American Bryological and Lichenological Society (ABLS)

ABLS is meeting in conjunction with the Bryological and Lichenological Section of the Botanical Society of America (BSA) at the AIBS (American Institute of Biological Sciences) meeting in Montreal, Québec, Canada, 3-7 August 1997. Other societies such as the Mycological Society of America (MSA) and the American Society of Plant Taxonomists (ASPT) will be present as well. The title of this symposium is "*Bridging the Gap between Phylogeny and the Classification of Lichen-Forming Ascomycetes*". Registration and housing forms for the meeting will be available later from AIBS (watch Bioscience magazine and their web site at <http://www2.aibs.org/aibs/> and the ABLS web site at <http://lucjeps.berkeley.edu/bryolab/ABLS.html>) A four-day excursion is also organized.

Symposium: *BRIDGING THE GAP BETWEEN PHYLOGENY AND THE CLASSIFICATION OF LICHEN-FORMING ASCOMYCETES*. - The lack of a stable classification for ascomycetes has been plaguing the fields of mycology and lichenology for many years now. Establishing a stable classification for ascomycetes will not be attained without interaction between mycologists working on non-lichenized ascomycetes and lichenologists. Therefore, it is crucial that we combine our efforts as often as possible to improve this unfortunate situation. To reach the main goal of this symposium, I have invited lichenologists with a broad and thorough knowledge of lichenized fungi and/or who have proposed new classifications based on phylogenetic studies, and mycologists who have a broad knowledge of ascomycetes in general. The theoretical aspect of using phylogenies to construct classifications will be addressed. This is very important, since many phylogenetic trees are being generated at different taxonomic levels, but the mycological community is still hesitant to "translate" this information into classifications, perhaps because many problems are associated with such a practice. The time seems appropriate to outline these problems and explore potential solutions. Another important objective is to explore the rationale and consequences of current trends in lichen classification at the genus level. This is a very sensitive issue within the lichenological community and this portion of the symposium, which will be addressed by P. L. Nimis, has triggered an intense debate, as early as March 1997, through an electronic discussion group devoted to lichenology. The ultimate goal is to provide a synthesis of the relationships among lichen-forming ascomycetes at different taxonomic levels based on morphological and/or molecular data, and explore the implications of using what we know about these relationships to build a better classification for lichenized ascomycetes and consequently all ascomycetes. This symposium was funded by the American Bryological and Lichenological Society and the Field Museum of Natural History. Convener: Francois Lutzoni

PROGRAM: De Priest, P.T., S. Stenroos, N. Ivanova, and A. Gargas: *Polyphyletic origins of the lichen association in the fungi: phylogenetic analyses of nuclear small subunit ribosomal DNA sequences*. - Eriksson, O. E.: *Orders and higher taxa of*

Ascomycota. Gargas, A.: *Origins of lichen associations: parsimony and maximum likelihood analyses of two data sets*. - Grube, M. & M. Matzer: *Classification and phylogeny of the Arthoniales*. - Hibbett, D.S. & M. J. Donoghue: *Integrating phylogenetic hypotheses and classifications in fungi*. - Lutzoni, F., J. Crodian & V. Reeb: *Phylogenetic relationships of ascomycetes as revealed by the small and large subunit nuclear ribosomal DNA with emphasis on lichen-forming ascomycetes and their origin*. - Nimis, P. L.: *The inflation of genera in modern Lichenology*. - Rambold, G., T. Friedl & A. Beck: *Photobionts in lichens: possible indicators of phylogenetic relationships in Lecanorales?* - Taylor, J. W.: *Sexual and asexual Ascomycota: evolution and classification*. - Tibell, L.: *The classification of calicioid lichens and fungi: morphological evidence, anamorph data and sequences of the ITS1-5.8S-ITS2 region and the 18S rDNA*.

EXCURSION: *Lichens of the Laurentian Highlands and St. Lawrence Valley*: Four-day trip. Trip departs Thursday August 7th at 8:00 a.m. and returns Sunday August 10 approximately at 5 p.m. Limited to 35 participants; cost to be determined. Dissected by deep river valleys, the Laurentian Highlands rise abruptly from the St. Lawrence River north of Quebec city to elevations near 1000 m. In the moist boreal bioclimate of this region, mossy balsam fir forests prevail at middle elevations, and black spruce forests (including patchy open lichen woodland) on rocky hilltops and peaty sites. En route from Montreal, contrasting *Acer-Carya* and *Acer-Betula* forests will be examined. Accommodation will be at well-equipped field stations, with facilities for examination of each day's collections. For more information contact: Francois Lutzoni, Dept. of Botany, The Field Museum of Natural History, Roosevelt Road at Lake Shore Drive, Chicago, Illinois 60605. Tel: (+1) 312-9229410 ext. 721; Fax: 312-3609858; e-mail: lutzoni@fmppr.fnmh.org. Co-organizers are: Stephen Clayden (clayden@mis.ca) and Ernie Brodo (ibrodo@mus-nature.ca).

Francois Lutzoni, Montreal

XII Symposium of Cryptogamic Botany

The traditional Symposium of Cryptogamic Botany, gathering together all cryptogamists of the Iberian Peninsula, could also be a new and challenging experience for many foreign students. The level of Spanish Cryptogamy (*s.lat.*) is so outstanding, that, from my own experience, much can be learned by taking part in such an event. This year the Symposium will be held in Valencia 17-20 September. As usual, the Symposium will be organized in five sections: Algae, Bryophytes, Ferns, Fungi and Lichens. The aim is to give an overview of the state of research, especially in the Mediterranean region, including Macaronesia. The program will encompass a wide array of themes such as: a) Flora, Systematics and Evolution, b) Life strategies and adaptations, c) Communities, Biogeography and Ecology, d) Ecophysiology, e) Biodiversity, Conservation and Global Change. Spanish and English will be the official languages. For further information please contact: Dpto. Biología Vegetal (Botànica) F.CC. Biològicas. Universitat de Valencia, E 46100 Burjassot (Valencia, Spain) Tel. (+34) 6-3864376, fax: 6-3864372, e-mail: cripto97@uv.es.

The Editor

Symposium: Taxonomy, Evolution and Classification of Lichens and related Fungi.

In connection with the annual general meeting of the British Lichen Society in 1998, BLS, The Systematics Association and The Linnean Society of London will arrange a Symposium devoted to the taxonomy, evolution and classification of lichens and related fungi. The Organising Committee has invited a number of speakers to the sessions, and the preliminary titles reflect the enormous current progress in lichen systematics at all taxonomic levels. The invited speakers represent a selection of well-established lichen taxonomists, as well as post-graduate and post-doctoral students at the forefront of lichen systematics. The aim is to present an integrated picture of the status of modern systematics, as well as providing an opportunity to assess the future challenge. The event will be held in central London during 9-11 January 1998, and the Symposium will have three half-day sessions each focused on lichen systematics at various levels. All friends and colleagues are herewith cordially invited to participate in the Symposium! We need to know as soon as possible how large the interest may be, and would appreciate to hear from people interested in participating before September 30th. (Please, contact (preferably e-mail!): Mats Wedin, Botany Department, The Natural History Museum, Cromwell Road, London SW7 5BD U.K. - Phone (+44) 171-9388852, fax (+44) 171-9389260, e-mail: m.wedin@nhm.ac.uk, to be included in our mailing list, and detailed and more definitive information will follow shortly! Do not forget to include your full postal address if you reply by e-mail! A registration fee of £30 will be charged. A wide range of accommodation types are available to suit all pockets. Participants will have to arrange accommodation themselves; we will, however, include a short list of hotels in different price categories in the information package that will be sent out to all responding to this circular. Organising Committee: Mats Wedin, O.W. Purvis (The Natural History Museum).

PRELIMINARY PROGRAM - FRIDAY: Registration, The Dougal Swinscow Memorial Lecture: R. Honegger (Zürich): *The lichen symbiosis - what is so spectacular about it?*, Evening Reception. **SATURDAY:** BLS Annual General Meeting. **SYMPOSIUM: TAXONOMY, EVOLUTION AND CLASSIFICATION OF LICHENS AND RELATED FUNGI.** I. The taxonomy of species and infra-specific taxa - Ph. Clerc (Geneva): *Species-delimitation and species concepts in Usnea*. - K. Lohtander (Stockholm): *Lichen species pairs*. - P.M. Jørgensen (Bergen): *How to classify and name the blue-green counterparts*. - P. Bridge & D. Hawksworth (Egham): *What molecular biology has to tell us at the species level in lichenised fungi*. **SUNDAY II.** The concept of concepts - the circumscription of taxa, particularly at the generic level - A. Crespo, O.F. Cubero & R. Noya (Madrid): *A molecular approach to the circumscription and evaluation of the genera segregated from Parmelia s. lat.* - M. Grube & U. Arup (Graz): *Molecular systematics of Lecanora subg. Placodium*. - R. Sundin (Stockholm): *The Arthonia story, or How to find monophyletic groups in large genera*. - P. L. Nimis (Trieste): *A critical appraisal of modern generic concepts in Lichenology*. - L. Tibell (Uppsala): *Principles and prejudice in lichen classification*. **III.** The integration of lichens into the system of the Fungi. The taxonomy at and above family level - S. Sterner (Helsinki): *Evolution and taxonomy of the stipitate lichens*. - K. Winka (Umeå): *Are there lichenised Leotiales?* - Th. Lumbsch (Essen): *Systematic studies in Lecanorales suborder Agryrinea*. - G. Rambold (Munich): *The distribution of selected diagnostic characters in Lecanorales*. A. Gargas (Copenhagen): *Phylogeny of lichen-forming fungi within the Eumycota*. - Symposium Dinner.

Mats Wedin, London

Personalia

Ted Ahti (Helsinki) is going to retire in July 1997, but will still be able to continue research at his present address at the University of Helsinki. Besides studies on the Cladoniaceae he has recently participated in the completion of lichen checklists of Finland (by O. Vitikainen *et al.*) and Russian Karelia (by M. Fadeeva *et al.*), which are expected to appear in 1997. Last year he conducted field work in Guyana, Mexico (twice), and Russia (Karelia, Murmansk Region), and is going to visit Brazil, Mexico and Iceland this year.

Bernard de Vries (Regina, Canada) undertook the identification of lichens collected by fieldstaff from the Saskatchewan Conservation Data Centre, Regina, during the 1996 Prairie Biodiversity Survey (PBS). Collections were made from selected geographic areas in the mixed grassland ecoregion of the prairie ecozone in south-central Saskatchewan. Contiguous landscapes with strong differences in local landform, soil parent material, and soil texture were selected for sampling in the extensive native grassland areas of the Coteau Hills north east of Saskatchewan Landing Provincial Park, and in the Chaplin Lake area south east off the South Saskatchewan River. Forty five sites and 144 relevés were sampled, and a total of 385 lichens collected, representing 19 genera with 36 species, 1 subspecies, 2 varieties and 2 forms. Predominant species found in all landscape units were: *Candelariella vitellina* (mainly on *Selaginella densa*), *Cetraria aculeata*, *Cladonia pyxidata*, *Diploschistes canadensis*, and *Physconia muscigena*. The main species on plateaux and hilltops was the "vagrant" lichen *Xanthoparmelia chlorochroa*.

Paul Diederich (Luxembourg) recently finished his world monograph on lichenicolous heterobasidiomycetes (Bibl. Lichenol. 61), and, together with A. Aptroot, E. Sérusiaux and H. Sipman, published the most important results of the 'Benelux lichenological expedition to Papua New Guinea 1992' (Bibl. Lichenol. 64). He is continuing his research on lichenicolous heterobasidiomycetes, and plans to prepare a first supplement in 1998; additional specimens on loan are most welcome. Together with F. Molitor he finished a study of the pyrenolichens and their lichenicolous fungi from Luxembourg, to be published in Bull. Soc. Nat. luxemb. 98. With E. Sérusiaux and P. van den Boom, he is now preparing a first annotated checklist of the lichens, lichenicolous fungi and related species from Belgium and Luxembourg, to be published in 1998.

Stefan Ekman (previously Lund, Sweden), defended his doctoral thesis "The corticolous and lignicolous species of *Bacidia* and *Bacidina* in North America" (Opera Bot. 127) in September 1996 with P. M. Jørgensen as opponent. From January 1997, he holds a 3-year research and teaching position at the Dept. of Botany, Univ. of Bergen, Norway. His research will include a study of the phylogeny and taxonomy of the Lecanoraceae s. lat. using nuclear rDNA sequences. Particular attention will be paid to *Bacidia*, *Bacidina*, *Toninia*, and related genera. This project starts with a pilot study performed in cooperation with M. Wedin in London during April. Additional research in the near future involves, i.e., a revision of the remaining North American *Bacidia* and *Bacidina*, i.e., taxa on substrates not treated in the thesis.

Margalit Galun (Tel-Aviv) received the Meitner-Humboldt award in recognition for past accomplishments in research and teaching.

REPORTS

The third IAL meeting in Salzburg: a personal account

"If God created large genera, why should lichenologists go against God's will?" (Pier Luigi Nimis, during a discussion at the IAL meeting in Salzburg, September, 1996).

Scientific meetings are often at the generative nodes that radiate new branches in the evolutionary tree of science. The IAL 3 conference in Salzburg (September 1-7, 1996) was no exception. Skillfully steered by the organizers, the 350 participants from 48 nations experienced a week of total immersion in a river (shall we call it the Poelt-Lange-Huneck river?) from which new effluents are emerging, their somewhat turbulent currents often twisting like a double helix. The beautiful city of Salzburg also conspired, with real water-saturation, to maintain a high level of participation inside the conference halls. The meeting started with a silent tribute to the late Joseph Poelt, whose presence reverberated throughout many presentations up to the end, when I. Kärnefelt led the participants through a slide history of post-WWII lichenology. Those photographs of the bygone greats and of the younger days of our contemporaries transmitted vitality and continuity. "Will DNA sequences become a surrogate for the detailed knowledge of the lichens we loved?" As early as 1992, at the IAL 2 meeting in Båstad, Sweden, I heard Poelt voice his concern on that point, and DNA-based lichen taxonomies were still in their infancy then! Four years later, DNA-based studies of lichen taxonomy and phylogeny are producing large numbers of posters and oral presentations, revealing and rearranging relationships from the population level (DePriest, Søchting, LaGreca) to the kingdom level (Lutzoni, Gargas). I think, however, that if Poelt could have been in Salzburg with us, ultimately he would have been reassured: the best DNA-based trees cannot exist alone, they need real lichens on their branches. The most reliable taxonomies combine DNA with more traditional morphological, chemical, and ecological approaches, and each perspective modifies, limits, and sharpens the conclusions of the other. DNA-based studies introduce into lichenology the advantages and drawbacks of modern, high technology-driven science. The new technologies allow us for the first time to answer fundamental questions asked since Schwendener's days: about the phylogenetic origin and, soon, the ontogeny of the lichen symbiosis. However, with the rush to resolve such basic issues comes a new competitiveness among the lichenologists applying the new methods. Some unusually lively exchanges of opinions occurred around the global phylogeny issue. Methodological arguments (i.e. my computer methods are better than yours!) erupted around lofty questions such as: was lichenization frequently reinvented during the evolution of ascomycetes (as commonly assumed) or was it rare or even unique (currently an anathema to many lichenologists)? A rare (2-4 times) or single origin of lichenization would turn most, if not all, filamentous ascomycetes into ex-lichen fungi. Mycology might at last become a branch of lichenology, at least for Ascomycetes! Once the dust settles, it will be interesting to connect the global fungal phylogenies (Gargas *et al.*; Lutzoni *et al.*) with that of lichen algae (Friedl) in which many, but not all, Trebouxiaceae appear monophyletic. Oh yes, algae, they are part of the lichen too...What are they really getting from the symbiosis, just the security of a routine job?

We still don't know, despite our theories. Several presentations addressed the peculiar aspects of the lichen's photosynthetic apparatus with new methodologies (De Los Rios; Leisner; Palmquist). Perhaps the symbiotic secrets of lichen algae will be eventually revealed by uncovering more of their photosynthetic adaptations. In lichen chemistry, the traditional analysis of compounds is beginning to be flanked by the application of molecular methods to search for the genes controlling their synthesis (Miao). Whether biotechnological usefulness (eg. in medicine) or theoretical questions (why do lichens make them?) drive this search, the benefit to lichenology seems obvious. The biotechnological exploitation of lichen metabolic potential does not mean the environmental depletion of lichens, as it did in the past. In principle, it is now feasible to transfer metabolism, via its genes, from the originating organism to experimentally convenient ones, like *Neurospora* (as indicated by M. Galun) or *Aspergillus* (which is a close relative of lichens according to the phylogeny of Lutzoni *et al.*). The original organism can be left intact while its genes are labouring in foreign environments. The development of lichen culture has come a long way since Ahmadjian's groundbreaking experiments, as S. Ott and E. Stocker showed using ascolichens and B. Langenstein using basidiolichens. Ott is using her culturing methods to experiment with the effect of phytohormones on thallus morphogenesis. Here lies the future of lichen culture, since we still don't understand the core issues of lichen symbiosis, i.e. the molecular communications and cellular responses between the symbionts while they create a lichen. Reproducible and simple culture methods will focus molecular, biochemical, and physiological manipulations on one or a few selected "model lichens", and will shed light on all lichens. In this regard, *Cladonia* is emerging as a versatile model system: it is used for population biology studies (DePriest), for culture studies (Ott), for cell fusion experiments (Galun), for the search for polyketide synthetase genes (Miao), and for studying the relationship between fungal DNA methylation and symbiosis (Armaleo). The good scientific contributions and the personal interactions among the participants constitute the chief value of scientific meetings, and they were the strong side of IAL3. These advantages outweighed the effect of the not-so-good contributions, whose presence is perhaps unavoidable at such large meetings. I feel, however, that the number of mediocre contributions might be minimized if the conveners of the various sessions remember that they not only deserve praise for the good presentations, but also blame for the bad ones. This limited account is clearly biased and I apologize for all the important contributions I failed to mention, including those on the ecophysiology and ecology of lichens. I also omit a description of the inspiring awards of the Acharius medal, reported in an accompanying article. I will briefly mention, however, a collective and not particularly inspiring contribution on the politics of lichens. At the plenary session one day before the end of the meeting, an extended dispute ensued: did the constitution require the election of a new IAL president (the candidate was M. Jahns), or did it allow to extend I. Kärnefelt's present tenure as president or, actually, did it matter at all what the constitution said? The most popular of all decisions was finally taken, namely to procrastinate until the next day, and let the drinks and the good food of that evening's celebratory dinner restore some sense in our heads. They did, and the next day it was recognized that the constitution required the election of a new president, and M. Jahns was voted in. However, it was also agreed that the constitution requires serious modifications which will be proposed and presented to the membership for discussion. There was a good side to that squabble: it reminded us why we are into lichens and not politics.

Daniele Armaleo, Durham

From the second Symbiosis Symposium

I have just returned from the above very successful congress in the marvellous location of Woods Hole, attended by around 150 people. There were only a couple of lichen papers but a fascinating array of symbioses were presented to us from the animals that dwell around hot vents in the deep oceans to orchids or the bacterial symbionts of aphids. They often made one think of parallels in the lichen world. A major difference from the first congress, was the role that molecular biology can now play. Not only were researchers able to determine the nearest free living relatives of symbionts using these techniques but they were often able to shed light on gene interactions and on the biochemical interdependences. There was, however, still plenty that experimental and observational science could contribute. Another feature was a symbiosis workshop for about 40 nearby school teachers. Dr Doug Zook of Cosmos, based in Boston, organized a series of experts to show how protozoa, termites, lichens, mycorrhizas, symbiotic cyanobacteria etc. could be used to make science teaching both more instructive and interesting. Many of us university types got lots of good ideas too !! Several of the teachers described how symbiosis could be a unifying theme and showed posters made by the children. It was decided to set up a new "International Symbiosis Society" which you can all join for the modest sum of US \$30 (students \$10). For this you will get a newsletter, information via the internet and a reduced subscription rate for the journal *Symbiosis*. To join, send US cheques or International money orders, payable to the society, to: Dr Charles Bacon, Treasurer of the ISS, USDA, ARS, Russell Research Centre, Athens, Georgia, 300613, USA. It is hoped later to arrange for payment by credit card but that is not yet possible. Nor will Canadian or Sterling cheques be possible as at the moment the US banks may charge as much as \$40 to clear them. Finally, the 3rd International Symbiosis Congress will be in Marburg, Germany in the year 2000. This very old university is situated in another historic site, a worthy successor to Jerusalem and Woods Hole.

David Richardson, Halifax

The Lichenologist

Over the last few years *The Lichenologist* has become increasingly attractive to many authors. Unfortunately, until recently, this resulted in growing delays between submission of manuscripts and their final appearance in print. This has now been improved by increasing both the frequency of publication (6 issues each year) and size of the journal (600 pages each year). The *Lichenologist* has now removed the back-log of delayed articles and become a journal for rapid publication. The journal is willing to accept longer articles than before, the proceedings of conferences, symposia and workshops, and review articles on any aspect of lichenology. The refereeing process will continue to be as rigorous as previously with Peter Crittenden, Josef Hafellner and Tor Tønsberg recently joining the editorial board. Although supported by the British Lichen Society, this is a truly international journal. Please address any questions to the Senior Editor, Dr. Dennis Brown at School of Biological Sciences, University of Bristol, Bristol BS8 1UG, UK. Tel (+44) 117-9287472. Fax 117-9257374 or e-mail to d.h.brown@bristol.ac.uk.

Dennis H. Brown, Bristol

Mogens Skytte Christiansen - An obituary

With great sorrow we have to announce that Skytte died February 7th this year at the age of 78. Skytte should have celebrated his golden wedding a month later. Besides his wife he left two daughters. Skytte belonged to the old school of botanical scholars with an all-encompassing interest in plants, mosses, fungi, microbiology, but of course in particular lichens. In addition, he mastered botanical Latin, etymology and nomenclature, much to the benefit of his colleagues. To the public he was well-known for a number of illustrated books on flowers, grasses and cryptogams, written in an easily understandable but yet inspiring language. Several of these popular books were subsequently translated into other languages. Already familiar with flowering plants, when he started his studies at the University of Copenhagen, Skytte focused his interest on cryptogams, and very early on began to study the Danish lichens. Lichenology was not highly esteemed at that time. The foremost Danish lichenologist, O. Galløe, was not even working at the university and P. Gelting had just begun his work. Gelting left the country during the war and later became leader of the Arctic Station in Godhavn, Greenland, while Skytte took positions at the Polytechnical High School and the Agricultural University until he was appointed head of "Botanisk Centralbibliotek", University of Copenhagen in 1952. His position as librarian allowed Skytte to concentrate his research on lichens. He made huge collections from all over Denmark and from many parts of Europe. By 1946 he had already collected in Greenland, but he never returned there; the sea journey had been too harsh for him. In his early career he provided collections for Galløe to illustrate in "The Natural History of the Danish Lichens". Skytte tried to identify all his collections, but soon discovered the difficulties in identifying *Verrucaria* specimens, and devoted much time and energy to that genus, in collaboration with M. Servit. Several new species from Denmark collected by Skytte were published in Servit's book from 1954, and also later in vol. X of Galløe's monograph. However, Skytte often later expressed scepticism concerning the species concept of Servit. Eventually Skytte passed on to other fields of lichenology but always retained an interest in and a good understanding of the genus *Verrucaria*. Lichenicolous fungi became Skytte's other great interest. In 1954 he described the genus *Nanostictis* and in 1956 his first work on *Lichenocodium* was published. He was particularly interested in *Lichenocodium* and *Taeniolella*, together with other imperfect genera, and contributed much material to D. Hawksworth's books on lichenicolous Coelomycetes and Hyphomycetes. In recent years he also studied lichenicolous Heterobasidiomycetes and was in frequent correspondence with Paul Diederich about them. Skytte did not make many scientific publications on his own, preferring to collaborate with others or simply pass on his material and observations to others. However, Skytte completed Galløe's "The natural history of the Danish lichens" by editing the last volume, which appeared in 1972. In the mid 1970's he collaborated with F. Rose, U. Søchting, K. Rankaer and S. Svane in making an inventory of the lichens in Danish ancient woodland localities. Skytte's scientific drive was the study and understanding of the organisms, and with that accomplished, he was happy to change subject. He made countless permanent slides of lichens and lichenicolous fungi in different media and photographed most of them at different magnifications, so that all the details are seen. Slides and photographs are numbered and kept in the same perfect order as the specimens themselves. His collections were always mounted and labelled in the most perfect way. When Skytte retired in 1988, he devoted most of his time to sorting, identifying and labeling his collections. Studying his old collections often revealed overlooked lichenicolous fungi and until November last year he eagerly studied those

groups. He left on his working tables numerous collections, slides and photographs especially of *Taeniolella*, *Lichenocodium* and *Verrucaria*. After the deaths of Galløe and Gelting, Skytte was for some years the only active Danish lichenologist. From the later 1960s, however, he was joined by lichenologists educated by himself, among them S. Svane, E. S. Hansen, U. Søchting and V. Alstrup. Skytte's lichen herbarium has been given to the Botanical Museum of Copenhagen (C), while lichenicolous fungi were handed to V. Alstrup. The lichenologists in Copenhagen intend to publish Skytte's undescribed species and will update the Danish checklist based on his collections. In this process we will miss him as a lichenological master, whose comments and advice were always worth considering.

Ulrik Søchting & Vagn Alstrup, Copenhagen

New Literature

Anna V. DOMBROVSKAJA. 1996. Rod *Stereocaulon* na territorii byvshego SSSR. [The genus *Stereocaulon* in the territory of the former Soviet Union]. Mir i semya-95, St. Petersburg, 267 pages. ISBN 5-87445-057-2. Price not given but orders should be placed to K. L. Verina, Ul. Rusakovskaya 2/1, apt. 99, 107140 Moscow, Russia; fax 95-2646459, e-mail hariprasad@glas.apc.org. - This is a treatment of 55 species of *Stereocaulon*, with morphology, lengthy descriptions and discussions, 71 tables of excellent drawings, brief statements of chemistry and distribution in the study area. Much follows Lamb's monographic studies, including many infraspecific entities, and all the nomenclatural novelties by Dombrovskaja (she is using this transliteration) have been published in her earlier papers. The book is a result of a longterm, painstaking work in the field and in herbaria, though her major herbarium KPABG (Kirovsk) is not cited in the work! The paper is entirely in Russian.

N. S. GOLUBKOVA, A. V. DOMBROVSKAJA, M. P. ZHURBENKO, Y. V. KOTLOV, Z. G. KRUSANOVA. 1996. Opredelitel lishaynikov Rossii. (Handbook of the lichens of Russia 6. Nauka, Sankt-Peterburg, 204 pp. ISBN 5-02-026044-4). - This is the sixth volume of the work which used to be called "Handbook of the lichens of the U.S.S.R." - vol. 5 came out in 1978. It includes the treatments of those lichens which used to be included in the Usneaceae but are now placed in the Alectoriaceae and the Parmeliaceae, as well as the Stereocaulaceae. The chapters by Golubkova on the horrible genera *Bryoria* and *Usnea* are necessarily rather provisional, since so much additional basic work is required to clarify both European and Asian taxa. The *Stereocaulon* treatment is just an abbreviated version of Dombrovskaja's monograph. An unusual feature - in my opinion outdated and misleading - is that numerous formae are recognized (17 under *Evernia prunastri*!); I hope nobody will use them. Otherwise the work is a well-executed, useful summary of the Russian species of the treated genera. (in Russian).

Teuvo Ahti, Helsinki

FORUM

Topic: Genus concepts in lichenology, proposed by P.L. Nimis

The present tendencies concerning the genus concept in lichenology somehow recall the Italian-Slesian revolution of 150 years ago, based on the use of microscopical characters. At that time, however, it did not end well: the hasty creation of hundreds of names was threatening nomenclatural chaos, and this just when new lichens brought back from the colonies awaited to be rapidly filed into clear-cut generic containers by the few lichenologists of the newly created National Museums. The harsh reaction started by Nylander culminated with the pinnacle of Zahlbruckner's *Catalogus*, where extremely unnatural generic concepts were often adopted. This was indeed a real monument, but also a heavy sarcophagus for fresh, sound, evolutionary ideas. The sarcophagus was so imposing that it conspired to hold back the recognition of monophyletic units amongst lichen-forming fungi for over a century. Timid approaches to resurrect a few more natural genera appeared only a few decades ago, first mainly at the expense of some of the larger crustose mega-genera, then also of some macrolichen genera. It was like a small rivulet of new genera, growing to a larger and somehow solemn river: Lichenology was waking up from an all too long sleep. Then, suddenly, came the flood, announced by a first wave: the splitting of *Parmelia*. No doubt, these studies brought about an immense increase in the knowledge of this group. However, several lichenologists felt, and still feel, that most of the new generic segregations were not justified, and that once this trend received more widespread acceptance, it would have resulted in serious problems for lichen taxonomy. This as an introduction. Here are some points for discussion: 1) Some recent generic splittings are often justified on practical grounds: the old genera were "too large". My objection is that, when both large and small genera do exist, this fact should be accepted and recognized nomenclaturally ("If God created large genera, why should men go against God's will?"). Otherwise, examples of "practical" splitting of large genera will be automatically extended to small genera as well, as is happening today, and this is much more difficult to justify on "practical" grounds. 2) "God created only the species, and not the genera", somebody objected during a dinner in Salzburg. I maintain that the Creation has an inner structure, which means that God created also the genera (please, have a look to any cladogram if you do not believe this). Hence, we cannot do just what we want with generic concepts, and if we split large genera just because they are large...the Inferno is waiting for us. 3) More and more lichenologists tend to assume that every supposedly monophyletic group of species deserves to be treated at the rank of genus. As there is no "lower limit" to the definition of the term "monophyletic" this assumption could lead to the recognition of every single species as a genus, which is obviously an absurdity. Where should we stop splitting? 4) Taxonomy has two faces: one for specialists, the other for users - and users are many more than specialists can see from their ivory towers. Generic names are an integral part of the binomial, and any generic change has heavy repercussions on nomenclatural stability. This does not apply to subgeneric-supraspecific ranks. When the taxonomy of a given group is far from being settled, and if there is no clear evidence that a supposedly monophyletic group of species has nothing to do with its older genus, the tentative segregation should be done at subgeneric rank. The new taxonomic information will be there, without causing unnecessary, and often provisional, nomenclatural changes. Names are too important and delicate a matter: we cannot play with names. 5) Do we agree that lichens are

fungi? More attention should be paid to generic concepts outside the narrow field of lichenology. Current trends risk isolating lichenology from Mycology again.

I myself had the following nightmare last year: "Let's take a large lichen family, with two small macrolichen genera and a huge genus of crustose lichens (Teloschistaceae). I can start from the small genera, segregating one species here, two species there, because of small anatomical differences. Why not? It has been already done elsewhere. Now the problem arises: what will this mean for *Caloplaca*? Well, some more or less clearly-defined groups are there, attracting, like mermaids, suitable candidates for new genera. No doubt, the new segregations could work, at least for a while, because a huge container is left for all the rest. Let's do it...". After waking up, I realized that, before doing it, one should first explore the whole container, since several surprising things could be left there. If I hastily try to slice from *Caloplaca* some juicy beef-steak genera, I'll be likely to create the premises for a nice hamburger. Then we'll have to deal with a nomenclatural hamburger. Gaining what in terms of new knowledge? Not a jot. Fast-food taxonomy? No thanks.

Many lichen genera are still artificial, and deserve careful segregation. Within larger units, such as *Caloplaca*, or the Verrucariaceae, we still have to tentatively define smaller groups of closely related species: is it really necessary to crown the recognition of every small supposedly monophyletic segregate with a new generic name? Should the motto of modern lichen taxonomy be: "*If I don't do it, somebody else will do it*"? Should not what happened one hundred years ago be a lesson for all of us? The whole matter is complex and controversial, it urgently needs discussion, and nobody can claim to have the right answer. In Salzburg several new generic segregations smoothly melted away before a more or less silent audience. In this, at least, history does not repeat itself: how far was that all too quiet pond from the stormy discussions about generic concepts of 150 years ago! But this, I am afraid, is not exactly a sign that the old sentence is true: "*Historia magistra vitae*".

Pier Luigi Nimis, Trieste

Reactions

The whole discussion on a "common generic concept" is stimulating but somewhat futile because there are no means to agree upon such a concept. First of all, genera or higher taxa do not evolve. They are human abstractions and not units of evolution. Only species evolve, or some other unit such as populations that can be conceived as existing entities of nature. Secondly, phylogenetic systematics is science, and any practical purposes of systematics such as nomenclature are subordinate to science. To be scientific, observations must be repeatable and hypotheses must be falsifiable. In working with phylogenetic systematics there are some basic assumptions that we must accept: 1. Organisms form patterns of groups that can be hierarchically arranged. 2. This hierarchy can be discovered by grouping the organisms on shared, derived characters through character state changes. 3. Ad hoc hypotheses of homoplasy are minimized by using the parsimony criterion. The diagrams, the phylogenetic trees, produced under those assumptions represent the hierarchy. The branching points, if being used as taxonomic groups, must include all members of the group otherwise groups will not be monophyletic. Therefore a suggested classification must be in accordance with the phylogeny. That includes the monophyletic groups we choose to call genera. There is no way round this. However, the size of a genus, how many species it should include, is a (subjective) decision that the individual taxonomist has to take.

Anders Tehler, Stockholm

I agree with Pier Luigi's introduction to the *Forum* discussion. Two main points should be addressed: 1. The grouping of taxa, and, 2. The ranking of taxa. - 1. The grouping: We all agree that the groups we wish to segregate should be monophyletic, i.e. they must include an ancestral species (known or hypothesized) and all of its descendants (Wiley 1981). This is not an easy concept to test for. When sexually reproductive characters (supposedly highly conserved) like ascus structure are used as synapomorphies, then the segregates encounter wide acceptance among us (see the splitting of *Lecidea* s. Zahlbr.). When vegetative characters (supposed to be much more open to convergence and parallelism) are used, then the segregated groups are highly controversial, as in the famous splitting of *Parmelia*. So, should we say that sexual characters should always prevail against vegetative characters? The use of sexual characters is not without problems. Just look at the present segregation trends in cetrarioid genera, where small variations in ascus structure, spore and ascus shapes are used to distinguish small entities. Where are the limits? My point is that we have powerful tools for testing monophyly, those of molecular biology, by sequencing ribosome, and hopefully very soon other genes. I can anticipate that the first (still unpublished) results on the sequencing of the 25S rDNA do not confirm the monophyly of most of the genera segregated from *Parmelia* s. lat. A possibility would be to require that every new segregation of large groups should be tested for monophyly with molecular methods. 2. The ranking: What should we do with groups which proved to be monophyletic? Pier Luigi is right when he writes "*there is no lower limit to the definition of the term monophyletic*". Here there will always be a large element of subjectivity, even when molecular methods are used. What we need is: a) sound judgement and wide experience, b) patience: "*we should first explore the whole container*" before making a sound taxonomic judgement, which often needs more collaboration and less competition, c) withdrawal of the ego (maybe one of the most important problems). Nomenclatural stability should be a high priority, since we cannot go on playing with names without a severe loss of credibility. The problem is that, in taxonomy, both name and author's recognition are connected by nomenclature! I see no other reasons why lichen taxonomists do not like to work at infrageneric levels. One among the possible solutions would be to cite only the basionym, as it is done in Zoology. Nowadays, anybody can validly publish anything, especially in journals that are not reviewed. Publication of new species or new genera should be allowed only in choosed specific journals, as it is the case. I believe, in bacteriology? In any case, editors and reviewers of journals, symposium proceedings etc., as well as the whole lichenological community, should take their responsibility when faced to *fast-food taxonomy*. There is still a long way to go, but the fact that we recognize the problems and that we talk about them is already a good sign. If we want our science to be accepted as basic and modern research we should find new ways of dealing with this important topic. I propose that the IAL could constitute a group, working out propositions, and submitting them to the lichenological community.

Philippe Clerc, Geneva

I liked Nimis' careful presentation of arguments very much. There is not one "good" generic division, but many phylogenetically correct systems are possible and equally acceptable. It is easy to make "good" new genera by just uniting existing ones. Splitting is more tricky, but becomes easier when the segregates are made small enough. Thus, one may say that there is no scientific progress in making a new genus itself. It is only the new arguments leading to this step, which mean scientific progress. If one discovers a good argument to divide a genus into two sister groups, the scientific gain remains the

same whether the new groups are treated as subgenera or as genera. The only difference is that in the second case other people are upset, as they have to adapt to new names. Another point concerns the strength of the evidence. If only one character is involved, this is the weakest possible evidence. It could be easily in conflict with the next character to be discovered. Consequently, two questions should be answered when a new genus is to be made: 1. Is there more than one character separating it from its closest relatives, or could any additional character provide an easy argumentation to make the division futile? (If so, users would be happy to keep the current generic arrangement); 2. What are the closest relatives of the new entities? Are they more closely related to each other than to other groups? (If so, treating them as subgenera would not require name changes).

Harrie Sipman, Berlin

The discussion started by Pier Luigi includes widely different scientific problems, as well as covering fields of psychology, sociology, and even subjective beliefs. Here, I will just touch some points which are mainly connected to our personalities. The naming of things is such an important issue that mankind has been aware of this since the oldest times (Genesis, 2: 19-20, cf. Gen. 1:29-30). Everything has to have a name in order to be or not to be. Naming gives power over the named, and success in the spreading of "our" names gives us some power even on other persons who have to use them. This is why the naming of taxa, events or laws etc. is so important for most people, and not only the fact that authors' names are connected to the taxonomic binomial. Does the zoological system result in fewer new combinations, less splitting and larger monophyletic groups? Yes, some ranks are nomenclaturally more important than others. If I accept or propose a subgenus or a variety this normally does not affect any writer of floras, checklists or general systematic overviews, any curator of herbaria, any teacher etc., but if I describe a new genus, or raise a variety to the species level, our impact on lichenologists is tremendous. The idea of names in current use, and the change of the code in the matter of conservation of names maybe can help us to avoid this, but this has not been the case so far. On the other hand, would we be prepared to let others decide whether our decisions are correct or not? Usually we know the group best, are there any better judges? If we can't agree on some existing persons' taxonomic superiority over the rest of us, it is useless to try to find formalised juries. *Systema Ascomycetum* or the meeting in Paris some years ago, when we tried to get consensus on the systematics of some lichen groups, can serve as good examples of rejected activities. I think we have to find other ways for a solution.

Jan Eric Mattsson, Lund

I do not agree with most of Nimis' points, for these main reasons: 1) When Nimis argues that lichens are fungi as all other fungi, he implicitly assumes that only - or mostly - sexual characters should be used to separate genera. If this criterion is adopted strictly, it could result in *Xanthoria*, *Caloplaca* and *Teloschistes* being re-united under the same genus. Are we really ready to accept this conclusion? If not, then the question arises: do lichens have something "special" with respect to other fungi? 2) "God" did not create genera, genera are names, and names are made, and used, by men. We use names for our practical purposes: uncultured people have a poor vocabulary, cultured people a rich one. The more names we have, the richer our world becomes. Why should lichenologists force themselves to use a poor language? 3) As genera do not exist as such, and as our vocabulary should fit our practical needs, Nimis should explain what is the practical advantage in having a dictionary where some hundreds widely different

objects are given the same name, just because they share a few characters considered to be as "more important", such as ascus and spore types. I heard so many generic lumpers in Australia saying: "look, there's a strange *Xanthoparmelia*!"! People around understood much more about the thing than if he had just said "*Parmelia*". 4) Nomenclatural stability is certainly important. But, fortunately, we no longer call all our beloved, strange beings *Lichen*. Modern Germans have problems in reading the *Nibelungenlied*, as many Greeks have problems in reading Homer. Let languages evolve, and among them our language, that of taxonomy!

Louis Le Bois, Venice

Response to Louis Le Bois's remark no.1: I agree that fungi are also (non-lichenized) lichens, but do not think that this implies that only sexual characters are to be used for generic delimitation. In large groups of non-lichenized lichens they are used not only for genus, but also for species delimitation, because there is little else one could use, while the mycelium does not seem to provide many useful characters. In *Hyphomycetes* many genera are installed without any use of sexual characters. Taxonomy should use any characters that can be properly defined, and objectivity requires that this should be done without *a priori* weighting. Thus, when lichenized lichens show a wealth of thallus characters, we should use them as best we can. The natural classification of lichens should reflect a phylogenetical process, and is principally different from a classification of physical objects, where a periodical system with few fixed criteria can be very useful. To me, it seems impractical to consistently use comparable criteria for similar ranks, not even in related groups. In *Parmeliaceae* this would lead to a single genus *Parmelia* with perhaps 1000 species next to dozens of genera for the 100 species until recently included in *Cetraria*. It reminds me of putting all insects in a single genus next to *Limulus* or some other genera of primitive crustaceans. I suggest maintaining supposedly primitive genera, where "basic" characters are variable, like *Cetraria s.l.* and *Omphalodinium s.l.*

Harrie Sipman, Berlin

Comment to Le Bois' second point - All taxa in one sense are names, but there exists also that reality to which we try to point with these names. Who would claim that that the group of pines (*Pinus*) with all its diverse species is nothing more than a name? Nature just is highly organized; that's one of the things about it that fascinates us, and it would be unreasonable to expect it to contain species not in related groups. Genera have an obvious reality apart from being mere names.

D. Wright, Fieldbrook, CA

Wright's response to Le Bois exactly reflects what I meant with the sentence "*If God created large genera,...etc.*" and with "*The Creation has an inner structure*". If genera are not mere names, but a reality, then we can expect that there will be something like large and small genera (e.g. *Pinus*, *Taxus*), and our names should fit this reality. Your point makes the deepest core of the whole matter very clear: the splitting of genera just because they are large implies the non-recognition of "genera" as a reality.

Pier Luigi Nimis, Trieste

I disagree, as usual, with Nimis. The point raised by Wright affects any taxonomic rank, not only genera. Yes, we have to deal with a hierarchically structured reality, and this hierarchy is the product of evolution-phylogeny. However, once the structure is

covered by a taxonomic hierarchy, the treatment of different taxonomic entities as "genus", "subgenus", "family" etc., is just a matter of naming, and here practical considerations are more than justified, as in the natural evolution of languages. We would not be able to speak about the world if this were not be structured. Our language should cover these structures as a thin, transparent layer. The world is complex, however, and these structures cannot be compressed into a rigid scheme formed by a few hierarchically arranged units, those of the same rank so to speak at the same "level". Genera do not exist as such, what exists is the taxonomic structure, and we can use generic names to describe it without worrying about the "existence" of something called "genus".

Louis Le Bois, Venice

Comment on the suggestion that taxonomic analyses should be based on a priori equally weighted characters. - A selection of characters is always made, consciously or unconsciously, because it is impossible to include every character (e.g. "the square root of spore width divided by the depth of the fissures separating areoles"). Any correlation of presumably independent characters is important. Selection of characters and unequal weightings should be made with the greatest care. It is easy to implicitly use a *a priori* judgements of the taxonomy within the studied group when choosing characters, and this must always be avoided.

Lars Fröberg, Lund

Individuals are discrete entities, but their resemblances fall into such a pattern that our mind can assemble them into hierarchically arranged groups, such that all entities within one group are more "like" one another than those in other groups. Though the genus is a human concept, it corresponds with something real if similarity discontinuities support its recognition. Otherwise, this would become purely arbitrary. It is my contention that such discontinuities do exist, and that it is the business of systematists to find them. However, the question will still arise as to the hierarchical level of the grouping thus recognized. To answer this question, reference should be made to the degree of dissimilarity - of discontinuity - between this and other groupings. To do this, we need suitable means of measuring similarity between taxa. I have proposed such a measure based on probability. A set of attributes is selected such that no logical or ontogenetic correlation between them seems likely (see the contribution from Fröberg). For each attribute, all possible pairs of alternative values are placed in order of similarity, and for each such pair of values the cumulative probability of that or any more similar pair within the reference population of taxa is assessed. This having been done for all the attributes, then for any given pair of taxa the probabilities are combined over the whole range of attributes, on the assumption that the attributes are uncorrelated. The lower the resulting probability, the more similar are the taxa compared. See an example in Goodall & Marchant (1996, Abstr. Bot. 20, 1: 1-15). It might well be possible to apply this approach to the recognition and separation of genera among lichens.

David W. Goodall, Canberra

One of the main problems of modern generic splittings is that most authors are satisfied with sufficient differences in characters, and that almost all new segregates with new names are proposed without any previous phylogenetic analysis. If we could agree that new taxonomic proposals should be based on some kind of phylogenetic analysis, then much should be gained.

Jan-Eric Mattsson, Lund

I believe that genera exist, contrary to the opinion provocatively expressed by Le Bois. They exist not as objects, but as landmarks in our way of expressing the diverging process of evolution. Populations diverge, become isolated, then reproductively isolated, turn into entities, sharing equal characters from a common ancestor. This is a continuous process, and thinking of this it is hard to accept monotypic genera. In Teloschistaceae, the delimitation of genera is traditionally controversial. Do we have a single supergenus, a few normally acknowledged, less well defined genera, or many smaller genera? *Caloplaca* is a great example illustrating the evolutionary forces within a group which we can only observe from one point in time and space. Together with my colleague C. Wetmore we have recently worked up a paper on the Gasparriniaceae for North and Central America. This group cannot be recognized at generic level based upon the character states we have today. It might be accepted as a section or subgenus. However, there are other good natural groups, i.e. some of the black-fruited and semifruticose *Caloplacae*. A new genus formed from entities earlier included in other genera is in the first place an uncomfortable procedure to learn and adapt to. "Why this splitting?", we may hear from slightly irritated readers. "The old name was good enough, etc." We have all heard this before. But if we have found some new and valuable information in character states, supported by evidence from several strong characters I cannot see the reasons why conservatism or convenience should prefer to hang on to something which was based upon irrelevant data from the good old days. Some of the genera from these days were good of course and still stand. Many were actually very bad. When I started my career, *Alectoria*, *Lecidea*, *Lecanora* and *Parmelia* included everything what we today have divided into a very large number of smaller groups. I guess that nobody would agree that these four genera from the early 1970's represent monophyletic groups. Where will the descriptive process end? Many of us contributed to move the snowball down hills, and people may ask how will it all end: "as an avalanche - I guess many would believe - obliterating the idyllic small ancient village down there, in the Acharian valley of the past". We can hear the most irritated claim that we will have nothing but genera left in the Parmeliaceae. Have we been moving the snowball in the right direction? Yes, I definitely believe so. In the other direction, i.e. "uphill", back to the good old days, would be against all natural forces and impossible at the end. We cannot state that everything which is published as new on the generic level is great and outstanding. But who can decide what is right or wrong here? Nimis was provocatively challenging us with the "Creator" talk. Who can ever decide what is a good genus or not, or who is our "Lord"? The "Creators" of *Systema Ascomycetum*, perhaps? Where we can actually read what is good or not, or accepted or not. Life on earth was not made in seven days but merely during a period of 1.5 billions years. *Psiloparmelia* or *Flavopunctelia* might still be great genera. The enormous number of new groups which have been separated during the last decades have taught us a lesson, perhaps to think twice before doing anything. Groups based upon one character don't seem particularly good. Even using 2 or 3 not very convincing characters in the definition of new genera doesn't help us much. The so-called genus *Gasparrinia* can be defined on 3 not very good characters. That's all. So I am not going to do it. If somebody would separate the usnic acid containing *Caloplaca* as *Flavocaloplaca*, the vulpinic acid containing *Rhizocarpon* as *Vulporhizocarpon* or the bluegreen containing *Peltigera* as *Cyanopeltigera*, these groups would probably not be allowed into the "Lords" system. But who knows... This might pass even quicker than the Seven Days of Genesis.

Ingvar Kärnefelt, Lund

I am an old man now, but I will say a few things about taxonomy anyway. First, no reputable taxonomist would describe a new taxon based on only one character, whatever the character. The ascus tip (used by some to describe new families) has proved to be variable within one genus! Then why describe new families based on this single character? Have they looked at all species in the genus/family to understand the variability? No. Only the type species and then usually only one specimen. This is no way to study evolution/taxonomy. What is going on with systematics? Do we have to blindly follow anything that is published? Many do, but the best do not, they evaluate each one, as my old master taught me. As a result of this teaching, I was one of the last in North America to still believe in *Parmelia*. Granted, there are several good genera there but NOT 90!!!! Do we have to divide genera until there are only 2-5 species per genus? Many of these genera have been erected either on a few characters or because "If I don't do it, someone else will" (as a famous lichenologist once said). Another reason for describing new genera is for the "notoriety" of having your name cited every time someone types a label (on some it even takes 4-5 authors to make up their minds on a nomenclatural change; some of the new author citations are too long for any label!). Is this responsible taxonomy or taxonomic inflation? It is time to remove author citations! Perhaps I have lived too long. Maybe everything has passed by. I think I received an excellent training on being a thoughtful taxonomist, but maybe that is not in fashion now. Maybe now the main goal is to divide and describe. I am sorry for taxonomy if that is true.

Cliff Wetmore, St. Paul

Many thanks to all contributors. This discussion was started and finished in less than 30 days using LICHENS-L, Cliff Smith's listserver (see next section and try it...you can get most of the original texts, who did not fall under the usual editorial castigations). Of course, the discussion does not stop here: it will go on in Montreal, London, and, as far as I know, it is already going on in many other places, including several bars and pubs near botanical institutions. In the next issue of the Newsletter, however, only a very limited space will be available for this topic, and this will be mainly reserved for contributions by colleagues without access to e-mail. New proposals for the next Forum discussion are welcome; this time, priority will be given to topics outside the field of taxonomy s.str.

The Editor

LICHENOLOGY-ON-LINE

E-mail - A listserver for lichenologists

IAL provides a bulletin board and discussion forum via its listserver "lichens-l". All lichenologists with access to e-mail are encouraged to subscribe by sending the following message to "listproc@hawaii.edu". Leave the message line blank and type the message "subscribe lichens-l your name" and then send. You should receive confirmation within the next hour or so. The confirmation message provides instructions for accessing previous messages which have been archived as well as other general "housekeeping" information. If you have any problems send an enquiry to:

cliff@hawaii.edu. The service is FREE. It provides an opportunity for rapid exchange of ideas, requests for information, etc., in an informal environment. The forum discussion on generic delimitation in this issue of the Newsletter was conducted on the bulletin board. Announcements of new World Wide Web (WWW) sites, meetings, field trips, and other services and opportunities are also made here. It is also an ideal place to advertise job opportunities. Information from the bulletin board, including WWW URLs, can be cut and pasted elsewhere on your computer using the EDIT command menu. The bulletin board is not for personal messages which should be addressed to the appropriate individual.

Cliff Smith, Honolulu

World Wide Web - Addresses of lichenologists

This rapidly developing and expanding mode of communication and information exchange has been increasingly accepted by lichenologists. If you have access to e-mail you should be able to download free software from Netscape or Microsoft that will provide the platform for navigating the WWW. Creating your own home page is now very easy using Microsoft Word NT. You need to establish an account with your host computer (server), that is, the computer that provides your e-mail service. Create your message in Word NT and save it as an .html file. Then load the file into your server account and view it on Netscape or Microsoft Navigator. Should you want to change the appearance of the text you can edit the file using Front Page software. When you have completed the job, save the file, reload it on the WWW and the new version is there. If you have problems I suggest that you get help from your local computing community. You will almost certainly find that there are many people who will be only too willing to assist. Perhaps one of the more exciting aspects of recent advances is the interactivity of web sites. IAL is taking advantage of this capability in the development of the listing of postal addresses, telephone and fax numbers, and e-mail addresses of the lichenologist community. A database of over 700 people has been created. This database can now be searched on-line by entering the following URL at your WWW site: <http://www.botany.hawaii.edu/lichen>. The screen will present you with a number of options. To search the database you click on SEARCH. You do not have to know the complete name or number for which you are searching. That is, you can conduct very specific searches for a person or you can make a much wider search. For example, by typing the letter "b" in the Surname box and then clicking on SEARCH the computer will generate a listing of all people whose name begins with B. To restrict the search a little, if you type "BR" you will generate a listing of names beginning with Br. Note that you do not have to worry about upper and lower case letters; the system is case insensitive. You can search in any of the fields provided. So, if you want a listing of all of the lichenologists in the database whose address is "Spain" you can either type in the name Spain in the Country box or click on Spain in the menu box. Alternatively, you could go to the telephone numbers and type in the country code followed by a space and then search. Typing in the space is important because the space delimits the country code. For those people wanting to search for areas within a country I suggest that you use the country code followed by the area code(s) then a hyphen of the region that you wish to find. This is the only method that I can suggest for searches within countries as some of you requested. Interactivity is involved in that you can choose to add, delete, or modify records in the database. That is, you can modify the database from your computer without having to go to anyone else to do so. Of course, this means that someone could conduct some mischief. To try to prevent that from happening we will keep back-ups of the database at regular intervals. We will also log all changes to

the database as they occur. So we will have an opportunity to backcheck an entry but we hope that we never have to. IAL hopes that the use of the listserver and the address database will further enhance communication within the lichen community.

Cliff Smith, Honolulu

New Web Sites

The Lichen Herbarium, University of Oslo: <http://www.toyen.uio.no/botanisk/lavherb.htm>. - The complete electronic database of the "Recent Literature on Lichens" (series 1-163) with 16960 records, compiled by William L. Culberson, Robert S. Egan and Theodore L. Esslinger, is made available in searchable form. An on-line database is supplied with search options for Norwegian lichen specimens in BG and O and the lichen type specimens in O. Checklists of Norwegian lichens include accepted names, selected synonyms as well as Norwegian vernacular names. Listings of taxa in the Norwegian and in the foreign herbarium at O are also provided as "technical files" to download and for usage in a relational or a simple database. A page with all publications from the herbarium since 1823 includes more than 200 entries. Various information of the "Threatened Macrolichens Project" etc. A web site with lots of authentic data!

The Lichenological Society of Japan (LSJ): <http://www.kulawanka.ne.jp/~yozyamam/0906E.htm>. - Various information on the societies' structure, reports and announcements on the Annual LSJ Meetings, a News Bulletin with reviews, new records of species etc., and an e-mail address list of about 30 society members.

The American Bryological and Lichenological Society (ABLS): <http://ucjeps.berkeley.edu/bryolab/ABLS.html>. - Besides the pages on the organization of ABLS, several infos on membership, meetings, as well as on journals (The Bryologist and Evansia) are offered. The "Internet Resources for Bryologists and Lichenologists" page (<http://ucjeps.berkeley.edu/bryolab/ABLS/resources.html>) provides links to other relevant web sites.

Lichen Land Entertainment Guide, Oregon State University: <http://www.mgd.orst.edu/hyperSQL/lichenland/index.html>. - On-line determination of several dozens of lichen species for new and more advanced beginners. For each taxon, descriptions, a colour photograph and infos concerning habitat and photo site are given. Useful for educational purposes.

The lichen herbarium, University of Trieste (TSB) - <http://www.univ.trieste.it/cgi-bin/g/bot/leggi> - The TSB lichen herbarium consists of ca. 30.000 specimens, two thirds of which were collected in Italy in the last twenty years. Information from the herbarium labels has been organized into a searchable database. You can get a list of species for each genus, and a list of specimens for each species. For every specimen the following data are given: number of the envelope, substrate, altitude, locality, collectors, collection date, exsiccatum nr. This information may be useful for those interested in receiving material on loan for monographic treatments.

Gerhard Rambold, München.

Lias Project

New LIAS modules with DELTA-based species keys are available since issue 29(3) of the IAL Newsletter: *Arthonia* - subset Taxa with red pigments (M. Grube), *Bunodophoron* (M. Wedin), *Carbonea* (J.-G. Knoph, G. Rambold & D. Triebel), *Cladonia* s. l. - subset Queen Charlotte Islands (I. M. Brodo & T. Ahti), *Dimelaena* (M. Matzer & H. Mayrhofer), *Lecidea* - subset Europe (H. Hertel); Genera of Lichenized and

Lichenicolous Ascomycetes - subset Genera with foliicolous taxa - beta version (G. Rambold & D. Triebel, most data sets revised by R. Lücking). The files can be downloaded from URL:

<http://www.botanik.biologie.uni-muenchen.de/botsammn/lia/modules.html>.

Gerhard Rambold, München

Back issues of ILN

The following back issues of ILN are still available: 9(1), 9(2), 10(1), 10(2), 11(1), 11(2), 12(1), 12(2), 13(1), 13(2), 14(1), 14(2), 15(1), 15(2), 16(1), 16(2), 17(1), 20(1) and further issues. Photocopies are available of: vol. 1(1), 1(2+supp.), 1(3), 2(1), 3(2), 6(2), 7(1-2), 8(1-2). Two indexes are also available: Index to vol. 1-8, Index to vol. 9-13. - According to a resolution of the IAL Executive Council, published in ILN 16(1), April 1983, the following charges will be levied for back issues of ILN: Vol. 1: US\$ 0.25 per number (3 per volume); vol. 2-8: US\$ 0.50 per number (2 per volume); vol. 9-13: US\$ 1.00 per number (2 per volume); vol. 14-17: US\$ 1.50 per number (2 per volume). Back issues from vol. 20 onward are available for US\$ 1.00 per number (3 per volume). The Indexes are free. New members will receive free only copies of the numbers constituting the volume issued for the calendar year in which they join IAL. Orders to be sent to H. Sipman, Bot. Garten & Bot. Museum, Königin-Luise-Strasse 6-8, D-14191 Berlin, Germany, fax: (+49) 30-83006186, e-mail: hsipman@fub46.zedat.fu-berlin.de.

The front-page illustration.

Tornabenia africana A. Massal., inedited drawing by Abramo Massalongo (kindly provided by G. Lazzarin, Museo Civico di Storia Naturale, Verona).

LIST OF SOCIETIES

- Australasia:** Society of Australasian Lichenologists (SAL). Info: Dr. J. A. Elix, Dept. of Chemistry, The Australian National University, GPO Box 4, Canberra ACT 2601, Australia.
- Central Europe:** Bryologisch-Lichenologische Arbeitsgemeinschaft für Mitteleuropa (BLAM). Info: Dr. Volker John, Pfalzmuseum für Naturkunde, Hermann-Schäfer-Strasse 17, D-67098 Bad Dürkheim, Germany.
- Czech & Slovak Republics:** Bryological and Lichenological Section of the Czech Botanical Society. Info: Dr. J. Liska, Institute of Botany, Academy of Sciences of the Czech Republic, CS-252 43 Pruhonice, Czech Republic.
- Finland:** Lichen Section, Societas Mycologica Fennica. Info: Dr. Teuvo Ahti, Department of Botany, P.O. Box 47, FIN-00014 University of Helsinki, Finland.
- France:** Association Française de Lichénologie (AFL). Info: Dr. Jean-Claude Boissière, Laboratoire de Biologie Végétale, Route de la Tour Denecourt, F-77300 Fontainebleau, France.
- Great Britain:** British Lichen Society (BLS). Info: Secretary, Dr. O.W. Purvis, Botany Department, The Natural History Museum, Cromwell Road, London SW7 5BD, UK.
- Italy:** Società Lichenologica Italiana (SLI). Info: Secretary, Prof. Giovanni Caniglia, Dipartimento di Biologia, Via Trieste 75, I-35123 Padova, Italia.
- Japan:** Lichenological Society of Japan (LSJ). Info: Dr. H. Harada, Natural History Museum and Institute, Chiba (CBM), Aobacho 955-2, Chuo-ku, Chiba 260, Japan.
- The Netherlands:** Bryologische en Lichenologische Werkgroep der KNNV (BLW). Info: Leo Spier, Kon. Arthurpad 8, NL-3813 HD Amersfoort, The Netherlands.
- Nordic Countries:** Nordisk Lichenologisk Forening (NLF). Info: Ulrik Søchting, Botanical Institute, Dept. of Mycology and Phycology, ø. Farimagsgade 2 D, DK-1353 København K, Denmark.
- North America:** American Bryological and Lichenological Society (ABLS). Info: Dr. Robert S. Egan, Biology Department, University of Nebraska, Omaha, NE 68182-0072, USA.
- North America, Northwest:** Northwest Lichen Guild. Info: Dr. Bruce McCune, Dept. of Botany & Plant Pathology, Oregon State University, Cordley Hall 2082, Corvallis, OR 97331-2902, USA.
- Poland:** Lichenological Section of the Polish Botanical Society (Polskie Towarzystwo Botaniczne). Secretary: Dr. W. Faltynowicz, Dept. of Plant Ecology, University of Gdansk, ul. Czołgistow 46, 81-378 Gdynia, Poland.
- Slovakia:** Lichenological Working-Group of the Slovak Botanical Society. Info: Dr. Eva Lisicka, Slovak National Museum, Vajanskeho nabr. 2, 814 36 Bratislava, Slovakia.
- Spain:** Sociedad Española de Liqueología (SEL). Info: A. Gomez-Bolea, Dept. de Biología Vegetal (Botánica), Fac. Biología, Univ. de Barcelona, Avda. Diagonal 645, E-08071 Barcelona, Spain.
- Sweden:** Svensk Lichenologisk Förening (SLF). Info: Dr. G. Thor, Dept. of Ecology and Environmental Research, Swedish University of Agricultural Sciences, P.O. Box 7072, S-750 07 Uppsala, Sweden.
- Switzerland:** Schweizerische Vereinigung für Bryologie und Lichenologie (SVBL). Info: Ph. Clerc, Conservatoire et Jardin botaniques, Case postale 60, CH-1292 Chambes/GE, Switzerland.
- USA, California:** California Lichen Society. Info: Janet Doell, 1200 Brickyard Way, #302, Pt. Richmond, CA 94801, USA.