The International Lichenological Newsletter is the official organ of the International Association for Lichenology (IAL). It is published twice yearly in English with selected items in French, German or Spanish. Information and news intended for publication should reach the editor at least one month prior to scheduled production (usually April and October of each year).

IAL membership is open to anyone who has an active interest in the study and use of lichens. Current dues are U.S. $20.00 for the six year period between successive International Botanical Congresses. Dues should be sent to the treasurer in U.S. CURRENCY with checks made payable to the "International Association for Lichenology (K.J. PUCKETT - Treasurer)."

IAL affairs are directed by a seven person Executive Council elected during the last International Botanical Congress. Council members elected at the 13th Congress (Sydney, Australia, 1981) are listed on the inside back cover of the Newsletter and will serve until the 14th Congress (Berlin, Germany, 1987).

Editor: Martyn J. Dibben, Ph.D.
Milwaukee Public Museum
Wisconsin 53233, U.S.A.

Cover Drawing: Leptogium minutissimum (Florke) Fr. Drawing by Lucy C. Taylor from American Artic Lichens I by John W. THOMSON (Columbia University Press, 1984). Scale = 0.5 cm.

international lichenological newsletter

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Editorial

New Editor and New Horizons for IAL

With this issue of the International Lichenological Newsletter I relinquish ILN editorship to Dr. Harrie J. M. SIPMAN (BGBM, Berlin, Germany) who will produce Volume 20, Number 1 of the series sometime in early February of 1987.

Previous editors before myself were Vernon AHMADJIAN (Clark University, Massachusetts, U.S.A.) and Ernie BRODO (National Museums, Ontario, Canada), so after 20 years it is appropriate that ILN move to new hands on a different continent. And what better place than Europe -- with its current proliferation of lichen researchers, and Berlin -- the site of the pending 14th International Botanical Congress!.

During the July 1987 IAL General Meeting new officers will be elected. Along with this I hope new policy will be developed to improve Newsletter funding and communication among officers and the membership. In particular, the question of yearly as opposed to six-yearly dues should be discussed; costs should be set high enough to also allow for some IAL sponsorship of selected events. Partial funding of society forays, inter-IBC meetings or symposia, events advertizing, and possibly publications should all be considered as part and parcel of IAL's support future. New horizons indeed!

Included with this issue is the standard PINK IAL Questionnaire return readdressed to Dr. Sipman. However, continued production of newsworthy happenings requires not just your response -- but new members. Encourage both delinquent lichenologists or borderline colleagues to join IAL and your institute's library to start a Newsletter subscription. Membership (currently just over 400) could be doubled before the next IBC and still have an 80% payment capability for annual dues. Only in this way can IAL truly become an international force.

--- Martyn J. DIBBEN

This issue of ILN is dedicated to Rolf Santesson on the occasion of his seventieth birthday

News and Notes

ARCHER, Alan (Australia) writes he spent an exciting week revisiting Canberra. With Judith Curnow (CBG) and Heinar Streiman, he and his wife travelled to Nursery Swamp and Mt. Coree along the Two Sticks Road. An interesting find was made on Black Mountain where Thysanthecium scutellatum was growing on soil rather than its usual substrate of burnt wood.

ASPERGES, Michel (Belgium) continues his studies on the Cocciferae of Belgium as well as preparing a list of lichens for the province of Limburg. He also is researching bio-indicators for heavy metals in the same province, and studying the macrolichens around Campine in the countryside between Aa and Nethe for the "Roi Baudoin" foundation.

DIBBEN, Martyn J. (U.S.A.) was appointed January 1, 1986 to the new administrative post of Chief Curator at the Milwaukee Public Museum. He assumed managerial responsibility for all collections (anthropolgy, botany, geology, history, invertebrate and vertebrate zoology), conservation, data processing, and registrar activities by a staff of forty-five scientists. In November he will lead a museum excursion to the Galapagos Islands. Beginning in 1987, a travelling photoexhibit on Amazonian Brazil will open at MPM based upon 1983-84 staff expeditions to collect plants for the Projeta Flora Amazonica program.

ELIX, Jack (Australia) recently spent time on Kangaroo Island, South Australia collecting more Xanthoparmelia. He and Jen Johnson are now revising Pseudoparmelia. A detailed study of thallus morphology, apothecial and conidial characters, chemistry, ecology, and distribution has shown what has long been suspected. Pseudoparmelia is a heterogeneous assemblage of several quite diverse groups of species. These groups are now being delimited and circumscribed, so beware - more Parmelioid genera on the way!

GALLOWAY, David (England) indicates he is making progress in completing several Pseudocyphellaria projects. First is an account of the New Zealand species (forty-eight) which should soon appear in the Bull. Brit. Museum, Nat. Hist. (Botany); then a reckoning of some forty-seven South American non-glabrous species. Future work includes a revision of the Australian, South American, and paleotropical populations of the genus. Also a reworking of Sticta and his NZ Flora glossary for the Australian Lichen Flora, and an investigation of the Australasian taxa of Psoroma sens. lat.

HENSSEN, Aino (Germany) reports on the fire at Der Philipps-Universitat, Marburg. Only part of the collections were lost, but teaching materials, the SEM, and other optics were ruined. Soot deposit required her own and adjacent rooms to be rebuilt. Fortunately, no foreign loans were damaged nor the research results accumulated over thirty years. Some 150 folders with notes and photographs, the associated negatives, field trip records and specimen lists, and some 20,000 permanent slides were saved. Her lichen library and other books got a black patina but otherwise survived. One lucky lady!

IMSHAUG, Henry (U.S.A.) was visited by David Galloway after the latter had spent three days in Boston looking at Sticta and Pseudocyphellaria in the Farlow Herbarium. The East Lansing campus of Michigan State University has an extensive and well curated collection of cool-temperate Southern Hemisphere lichens. Over the years, Henry and his students have made superb collections from Auckland and Campbell Islands, southern New Zealand and Chile, Tierra del Fugo, Juan Fernandez and Staten Islands, the Falklands and Kerguelen. He has a lichen flora of Juan Fernandez substantially complete.

IWATZUKI, Zen (Japan) announces that his student Mr. Harada is studying ontogeny, chemistry, and taxonomy of Dermatocarpon (including Catapyrenium). He makes a request for fresh specimens to be sent to them c/o: Botanical Institute, Faculty of Science, Hiroshima University, Higashi-senda-machi, Hiroshima 730, Japan.

KANTVILAS, Gintaras (Australia) reports that he has completed and submitted his Ph.D. thesis. For the next four months he will be working with the National Park Service completing studies of sedgeland heaths he has been involved in over previous summers. He then hopes to return to his work on lichen studies.

LAMBLEY, Peter (England) - formerly Assistant Treasurer of BLS - now has an STO position at the University of Papua New Guinea to set up a National Resource Center. During his three year stay he intends to collect lichens in as many different localities and habitats as possible to expand current knowledge of the flora. He can be contacted c/o: Biology Department, The University, P. O. Box 320, Port Moresby, Papua New Guinea.

NASH III, Tom (U.S.A.) spent three months on sabbatical leave from Arizona State University at the Australian National University. Under the auspices of a US-Australian Cooperative Science Program, he also took time to collect in South Africa and the south island of New Zealand. He brought with him a number of his Saudi Arabian and South American Xanthoparmelia collections for examination. Following a chemical overview, he and Jack Elix will undertake a revison of the South American species.

RAMBOLD, Gerhard (Germany) is currently working on Australian saxicolous species of Lecidea sens. lat. under Hannes Hertel at Munich. With support from an ABRS grant he has been able to visit "down under" to discover terrain and materials from Melbourne, Victoria, Canberra, Sydney, Brisbane, Townsville, central Australia and Perth. All of this in a four month trip! A detailed account of his exploits is given in the Australian Lichenological Newsletter 19 (August), 1986.

SOCHTING, Ulrik (Denmark) is continuing taxonomic studies in Copenhagen on North European and arctic species of Caloplaca. The species of Svalbard will be treated first following a field trip to the area this summer. Ecological studies on changes in Danish lichen heath vegetation following nitrogen deposition have also been initiated.

THOR, Goran (Sweden) is working on Chiodecton and related genera at the Botanical Institute, Stockholm. He spent late 1985 in New Zealand and Australia where he examined Knight type material in Wellington, collected in tropical and subtropical areas, and then visited Canberra, Brisbane and Melbourne.

VERDON, Doug (Australia) and Jack Elix have recently won an ABRS grant to undertake revision of the Australian species of Leptogium. The two have also completed description of a new foliose lichen genus erected to accomodate two new species from north Queensland. One grows on the walls of caves and rock cavities and the other on rainforest trees. Both have stipitate apothecia and are believed related to Gymnoderma.

VOBIS, Gernot (Germany) stayed for four months (March-June) at the Universidad Nacional de La Plata, Buenos Aires, Argentina. As a guest of the Herbario Spegazzini he gave lectures in general lichenology to graduate students. His stay was made possible through the combined resources of CONICET (Argentina) and DAAD (Germany).

WILKINS, Alistair (New Zealand) has been on sabbatical leave at ANU (Canberra) from the University of Waikato. He worked with Jack Elix's group supplying a much needed triterpenoid expertize. He plans to extend his work on the Pseudocyphellaria triterpenes in an effort to interrelate patterns of variation with distribution. This will hopefully provide some insight into the evolution and geographical dispersal of the genus.

Meetings

British Lichenological Forays

The 1987 season begins with an April 10-12 Bristol University workshop on How different are the lichen floras of geologically different limestones (contact: D. J. HILL). This is followed by Over the Sea to Skye from May 20-June 1 headquartered at the Isle of Skye Field Center (contact: B. J. COPPINS).

The Summer Field Meeting will be in Ireland at two locations; Co. Sligo from August 29-September 5 and Connemara from September 5-12 (contact: D. H. RICHARDSON). The Autumn Field Meeting will be at Rye, on the Kent coast, the last weekend of October (23-25) just before British Summer Time ends (contact: Frank BRIGHTMAN).

The usual slate of Field Center Courses takes place across the year at Iosehill Hall, Juniper Hall, Slapton Ley, Kindrogan, Orielton, Preston Montford, Malham Tarn, and Leonard Wills. Subjects covered range from lichen ecology through lichen taxonomy to air pollution indicators and winter botany.

XIV International Botanical Congress, 1987

The third and final circular for this July 24-August 1 meeting in West Berlin has been released. It contains a modified Congress Bookings form B (revised for late bookings) due by January 31, form D for congress registration (including local tours, accommodation, social program, luncheons, and advance order of congress momentos) due by February 15, and abstract submission form E (for posters, papers, or lectures) due by May 31. Late payment of Congress fees may be made up to June 30; after that at-congress registration rates apply.

The Congress opens for registration on July 19. Nomenclature sessions follow running daily from July 20-24. Opening and closing ceremonies are July 24 and August 1, respectively. Scientific program occurs July 25- August 1, with July 28 set as a free day for local tours. Registration fees for full participants are DM 500 (pre-), 650 (late), 750 (at Congress); for students DM 180, 220, 250, respectively; and for accompanying persons DM 180 (irrespective of date).

Participants are reminded to take both the Second and Third congress circulars with them, to be sure that they have the correct travel documents and insurance, and to check their air-baggage through to the Berlin-Tegel airport. If coming by ground transport read the General Information section in the Third Circular. The usually slow summer months of Berlin are offset this year by its 750th anniversary. Many cultural events will take place across the year with some coinciding with the IBC. In particular the Historic Fair, Ship Pageant, and giant "rock concert" - the latter to take place in front of the Reichstag building just after closing of the Congress. Several exhibitions with botanical themes will occur at the State Library, in the Berlin Congress Hall, and at the Botanical Museum in Berlin-Dahlem. And available tours include both the Berlin Zoo and the Berlin-Dahlem Botanical Garden as well as night-life activities.

Some forty Special Interest Group Meetings of limited (invited) attendance will take place during the Congress. Requests to participate must be addressed to the group leaders listed in the Third Circular. Dates and times of individual symposia, sessions, and special meetings will be published in the Program Book available upon check-in once in Berlin. Congress organizers will not know exact schedules until July 15, 1987. The program book, abstract volume(s), and congress proceedings available for participants may also be obtained on a subscription basis by institutional libraries for a fee of DM 180 payable before May 15, 1987. Excursion booklets for each of the thirty-two Congress Excursions now to take place are also available at DM 6 apiece or DM 120 per set by subscription. In both cases contact the Congress Secretariat as listed in the circulars. Lichenologists should note that Excursion **38** (Epiphytic, terricolous, and saxicolous lichens of Spain) is now cancelled.

A business meeting of the International Association for Lichenology will take place in Berlin for the purpose of reports, officer election, and future program decisions. Contact for the XIV IBC/IAL arrangements is Dr. Harrie SIPMAN, Botanischer Garten & Botanisches Museum, Konigin-Luise-Strasse 6-8, D-1000 Berlin (West) 33, GERMANY. Phone: +49-30-830 06 103.

Joint 1987 BLS / Linnean Society Meeting

The British Lichen Society-AGM will change its 1987 date from January to February to coincide with the fourth of a series of meetings (at Burlington House, Piccadilly, London W1V OLQ, U.K.) arranged to mark the bicentenary of the foundation of The Linnean Society of London.

Horizons in Lichenology will take place on February 19 from 10:00 to 17:00 hours and be chaired by Prof. W. G. CHALONER, President of the Linnean Society. Invited speakers will include D. L. Hawksworth (Fungus-Alga Associations: Variety and Evolution), H. M. Jahns (Establishment and Growth of Lichen Thalli), D. H. S. Richardson (Pollution Sensitivity in Lichens), W. L. Culberson (Lichen Culture and Understanding Chemical Variation), D. J. Galloway (Plate Tectonics and Southern Hemisphere Macrolichens), V. Winchester (Lichenometrics and Historic Structures), E. Serusiaux (Ecology of Foliicolous Lichens), F. Rose (Phytogeography of European Lobarion Communities), and M. R. D. Seaward (Progress in Studying the British Lichen Flora). Discussion and closing remarks will be followed by dinner at Imperial College in South Kensington.

Variation in Lichens is a supplement to the above Linnean Society meeting and will take place on February 20 (still in Burlington House). It will be chaired by D. H. DALBY (of Imperial College) from 10:30 to 15:30 hours, and be a more informal gathering of BLS with some half-dozen invited papers and a slew of shorter contributions. Following a post-meeting supper, BLS will hold its Book Auction in the Linnean Society Library. Next day (February 21), BLS will hold its AGM at the British Museum of Natural History, Cromwell Road, London SW7 5BD begining at 10:00 AM. The morning will conclude with an exhibition meeting as usual, but the afternoon lectures will be replaced by a members slide show and "Flora Workshop." This is your chance to see the early flora keys!

Registration for the meetings should be made with T. H. MOXHAM, Secretary BLS, Department of Plant Sciences, University of Bath, Bath, Avon BA2 7AY, England, U.K.

Reports

American Bryological & Lichenological Society

The 1986 ABLS Annual Meeting took place August 9-13 at the Amherst campus of the University of Massachusetts. The paper sessions were preceded by a two-day (August 9-10) joint foray with the Botanical Society of America to Ascutney State Park, Pownel Bog, and Chalk Pond, Vermont.

August 11 saw a morning bryological poster session followed by an afternoon with twelve contributed lichen papers. Clifford W. SMITH (Hawaii) both presided and spoke while others who gave papers were: Anna M. M. REID, Sharon P. GOWAN, James D. LAWREY, Robert S. EGAN, Lois BRAKO, Maria Rose BLEWITT, Larry St. CLAIR with Rebecca D. FIELDS and Minoru NAKANISHI, Kathryn J. MALODY, Bruce D. RYAN, and Thomas J. SULLIVAN.

August 12 was devoted to both morning (13) and afternoon (10) contributed papers in bryology. A combined business meeting with the Bryological and Lichenological Section of the Botanical Society of America followed. William Louis CULBERSON moved from President-Elect to President of ABLS for the 1987-88 biennium. The meetings closed with an August 13 evening mixer in the U of M's Faculty Club.

IAL Interim Foray - 1986

The third interim IAL foray was held January 5-22, 1986 in Namibia (SW Africa) and the Republic of South Africa. The trip was sponsored by the University of the North (South Africa) and organized by Dirk WESSELS. All aspects of the trip were arranged extremely well, and the participants had a unique experience collecting in an incredibly lichen-rich countryside.

The first five days were spent in Southwest Africa where the group saw extensive lichen communities in the coastal mist zone. This included a four square kilometer patch of Teloschistes capensis and one of the few localities where Santessonia namibensis occurs.

The rest of the time was spent in South Africa divided between the Soutpansberg and Drackensberg mountains of northern Transvaal and the Little Karoo, Table Mountain, and Cape Nature Reserve areas of southern Cape Province. A number of new species were found and many new records made.

The following lichenologists were on the foray: T. H. Nash (USA), R. C. Harris (USA), J. C. Krug (Canada), V. Wirth (Germany), M. E. Hale and wife Bea (USA), H. Sipman (Germany), W. R. Buck (USA), R. P. Beckett (RSA), F. Brusse (RSA), I. Karnefelt (Sweden), and D. Wessels (RSA). They were accompanied and assisted by local botanists and conservation officers on most legs of the trip.

--- Mason E. HALE

Lichen Workshop - Univ. of Auckland (NZ)

Fourteen participants from Auckland, Christchurch, Hamilton and Wellington took part in a November 1-4, 1985 lichen workshop held at U of A's Botany Department. Organizers were John BRAGGINS and Anthony WRIGHT with assistance from Alison Stewart and Ewen Cameron.

Day one involved introduction to lichen characteristics and terminology, followed by a foray onto the campus grounds. A surprising number of lichens were found on trees, stonework, and even glass. Day two involved a trip to Western Springs where the basalt rocks (and debris) of an abandoned quarry provided a variety of shaded and exposed substrates. The very common Xanthoria parietina was found alongside X. ligulata; and Punctelia borreri proved to be not uncommon although previously unreported.

Day three consisted of an all-day trip to the Coatesville Scenic Reserve near Albany. This is an area of regenerating kauri forest with a dense understory of nikau palms and tree ferns, and much kanuka and Hakea in the more open parts. A greater variety of lichens were present, including a diversity of Cladias, Cladonias, and green-black gelatinous Collemas. The final day was devoted to identifications. Participants became more confident, but still got "stuck" or made wrong choices among David Galloway's keys. Bruce Hayward proved most useful here, but confusion still reigned in trying to separate Parmelia, Parmelina, Parmotrema, Pseudoparmelia, and Xanthoparmelia.

The lasting impressions were the friendliness of the workshop, the help given by the organizing committee, and the camaraderie and enthusiasm of the participants. Lichen forays are definitely a positive experience!

--- Howard and Elizabeth LINTOTT

Munster International Symposium

A very successful international symposium on "Progress and Problems in Lichenology in the Eighties" was held at the Westfalische Wilhelms-Universitat, Munster, West Germany from March 16-21, 1986. Around 130 lichenologists from some 20 countries attended this scientific meeting planned by Elisabeth PEVELING with help from Aino Henssen and Otto Lange.

Some 50 papers were given under four major themes: Developmental Morphology and Growth (11); Metabolic Processes and their Structural Pathways (15); Systematics and Distribution (6); and Systematics and Chemotaxonomy (17). Abstracts of papers were published in a special volume of Bibliotheca Lichenologica and a full report of the meetings will be given in ILN 20(1/2), 1987 by the new editor Harrie Sipman.

7th Australasian Lichenologists Meeting

The major concern of this two day meeting held May 10-11, 1986 was update on status of the Flora of Australia project. Sixteen members were in attendance with Rex Filson and Doug Verdon sending apologies.

The flora will now consist of five volumes for lichens, the first volume of 1984 being split into two. Alex George stressed that all manuscripts must follow the established Guide to Contributors, but that funds would be available to cover costs of manuscript compilation.

The classification of lichens as set by Rod Rogers was accepted. He explained the rationale for lichenized fungi being classed as Prototunicate, Unitunicate, and Bitunicate Ascomycota as being conventional rather than phyletic. Questions over the family placement of Physciaceae and Teloschistaceae within the Lecanorales, if growth form concepts applied, was resolved by selecting not to divide families artificially. A firm system should be resolved by year's end that will satisfy all concerns.

The deadline for Volume I was put at 1990. It was agreed any difficult species would be left out rather than hold up publication. Rod Seppelt addressed concern over subantarctic and other outer islands. After debate, it was decided to leave such floras out so that they might form an additional volume at a later time. Alan Archer asked some general problems with respect to the Cladonia script which is practically complete; the Guide for Contributors seemed to cover most concerns. Use of existing drawings or black & white photographs is preferred to executing new ones. ABRS will send "specimen seen" Flora labels to all contributors who ask for them.

A discussion on chemical techniques by Jack Elix will be included in the introductory part of Volume I. Jack explained his computerized data base for identification of lichen metabolites. Jen Johnson gave a practical demonstration of the MacIntosh mouse in action. Alan Archer queried how to indicate acid concentration differences within species. Group agreed on a major (M), minor (m), trace (t) labelling to be placed after listed acids.

Nell Stevens outlined benefits of a computerized data base for plotting the distribution patterns of lichens. She will investigate the applicability of the phanerogamic program at CSIRO Canberra. Alex George mentioned the possible use of DELTA data for storing lichen information.

Meeting concluded with agreement to meet in 1988 (Australia's bicentennial year) at Sydney Botanical Gardens herbarium with possible workshop in the Blue Mountains. However, it was also agreed that a Wellington (New Zealand) meeting should take place soon across the water!

Journals

Graphis Scripta

"Graphis Scripta" is a new periodical from the Nordic Lichen Society (Nordisk Lichenologisk Forening - NLF) edited by Vagn ALSTRUP, Institut for Okologisk Botanik, Kobenhavns Universitet, O. Farimagsgade 2D, DK-1353 Kobenhavn K, Denmark. Contact persons for NLF throughout "Nordicland" are Eric Steen HANSEN (Denmark), Heino VANSKA (Finland), Hordur KRISTINSSON (Iceland), Einar TIMDAL (Norway), and Leif TIBELL (Sweden).

The journal will contain announcements from the society about lichenological events in the Nordic countries and is open also to international news. Reports will be published in English or Scandinavian with an English summary. Scientific papers of special interest to Nordic lichenology are to be given priority. For technical reasons photographs must be in black and white only and of sharp contrast. Manuscripts should be sent to the editor ready to publish as they will NOT be sent to referees before acceptance. Authors receive 10 copies gratis; extras may be ordered at cost.

Volume 1, Number 1 contains a tribute to Rolf Santesson on his 70th birthday, and reports about lichens from northern Sweden and east Finnmark, urban corticoles from Copenhagen, and NLF's 1985 foray to central south Norway. The journal is expected to appear twice a year. The price is 50Dkr for Volume I (about 100 pages). The subscription fee should be sent to Postal Account # 8 50 50 04, Nordisk Lichenologisk Forening, c/o Ulrik Sochting, Institut for Sporeplanter, O. Farimagsgade 2D, DK-1353, Copenhagen K, Denmark.

Miscellaneous

L'Association Francaise de Lichenologie

At the Assemblee Generale held in Sion, Canton Valais, Switzerland, May 8, 1986, the members set the 1987 meeting for the same date to be held in Mesnil St. Pere near Troyes (Aube). A one-day excursion on the following day will go to the Foret d'Orient. Details for the foray will be arranged by Louis VAILLE who can be contacted at Mesnil Saint-Pere, 10140 Vendeuvre, Aube, France.

Current AFL membership stands at 95 persons from 16 countries with 59 members resident in France.

British Lichen Flora

A three year grant of just under £45,000.00 has been awarded by the Natural Environmental Research Council for the production of a (new) British Lichen Flora. Prepared by Professors David Moore (Reading University) and David Hawksworth (CMI), the grant will mostly fund a post-doctoral research assistant to work with the writers, Brian Coppins (Edinburgh), and Peter James (BM). The last attempt at a U.K. treatment was the "Monograph of the British Lichens" series published 1911-26 by Annie Lorrain SMITH, and while this and more modern treatments (like Duncan & James - 1970) have use, none deal with the full flora and modern interpretations of the literature. The BLS has established an eight-person Advisory Group to test manuscript drafts as developed, and Mark Seaward will provide updated distributions information from the BLS Mapping Scheme. Following appropriate interviews, Dr. William PURVIS has been chosen to coordinate production of the Flora.

To date initial progress has involved general agreement on the layout of generic accounts (alphabetical), species descriptions, and the format for keys. Terminology is being standardized, and newly prepared line-drawings of important diagnostic features will be provided. Much new data will be included such as reassessment of spore sizes, information on secondary metabolites, and description of anamorphic states. Most of the genera thought to be problematical have already been assigned; individuals are expected to produce draft accounts by autumn of all British macrolichens. BLS field meetings and Field Study Center lichen courses will be the testing ground. An extremely tight production schedule has been drawn up aiming at a 1989 completion date (miracles permitted!).

British Lichen Society Bulletin

Editor Oliver GILBERT (University of Sheffield) will take a one-year sabbatical during 1987; his role will be assumed for the interim by Frank BRIGHTMAN, South London Botanical Institute, 324 Norwood Road, London SE24 9AQ.

Bulletin 58 (not to be outdone by the French) contains a tabular key to 15 yellow taxa of Rhizocarpon identified so far for the British Isles. In the same issue Cudbear takes over from Vinifera in the satirical comments corner now labelled Lichenologia, and Part 1: Parmelia of an annotated catalog "A Chemical Checklist of British Lichens" begins. A series of etymological notes on lichen names also makes its debut. Data on Lancashire and Wiltshire lichens, early orchil production, the flora of lightning conductors, the fall Aigas Field Center foray, and a photograph of French "epiautomobilic" lichens help complete the issue.

Bulletin 59 leads with an illuminating article on "Revelations of a Lichen Illustrator" by Claire DALBY. She is the artist for the BM/BP educational wall charts Lichens and Air Pollution and Maritime Lichens (the latter in press), the limited edition BLS lichen cards, and the October 1986 Botanical Illustration Course given at the Leonard Wills Field Station. The same issue reports on Mason Hale's "anti-lichen" archaeological conservation studies in Central America, the recent resurgence of interest in (and new evidence for) lichens on Mars, BLS activities down on The Lizard, the post-Chernobyl effects of radiated lichens on autumn culls of Scandinavian reindeer, and the desire for a BLS Logo Competition.

Dodge Lichenological Literature

The Farlow Reference Library and Herbarium of Harvard University has received a considerable number of books and reprints from Dr. Carroll W. Dodge, prominent American lichenologist.

A list of items available for distribution or sale is enclosed (see WHITE flyer). Those persons interested in obtaining any of these materials should contact: Geraldine C. Kaye, Farlow Reference Librarian, Harvard University, 20 Divinity Avenue, Cambridge, MA 02138, U.S.A.

Friends of the Farlow Fellowship - 1987

The Friends of the Farlow announce availability of a graduate fellowship for the study of cryptogamic botany at the Farlow Herbarium during 1987 (see YELLOW flyer enclosed). The fellowship is intended to cover expenses up to $1,000.00 for students enrolled in graduate degree programs who wish to engage in short-term study at the Farlow.

Interested graduate students should submit a letter of application, describing their proposed work at the Farlow and its relation to their current work and/or professional goals. They should include projected expense, duration, and schedule of their planned visit. At times during the year (especially in summer) the Farlow can provide free housing for visitors. The fellowship will include that provision whenever possible.

The closing date for applications is April 1, 1987. Proposals should be submitted to: Dr. Robert K. Edgar, FoF Fellowship, Farlow Reference Library & Herbarium, Harvard University, 20 Divinity Avenue, Cambridge, MA 02138, U.S.A.

Deaths

John K. BARTLETT (New Zealand): 1945-1986

John Kenneth Bartlett of Pakuranga, Auckland (N.Z.), died suddenly May 1 of this year. With his death New Zealand lost one of its finest plant collectors since William Colenso. An honors graduate in mathematics, he was by profession Senior Science Master at Sacred Heart College. He developed his hobby of botanizing only in the early 1970's, and rapidly became a tireless collector of both New Zealand's cryptogams and flowering plants. 'Hurricane' Bartlett was best known to many colleagues in Europe and North America through his correspondence, only recently visiting institutions to study bryophytes and lichens. To fellow Australasians he was becoming famous for his numerous (some to be posthumous) papers on plant floristics and taxonomy, and his uncanny knack of turning up new plant records whenever he forayed in North Auckland.

His abilities as a collector of cryptogams are commemorated in the moss names Bryobartlettia costata, Hypnobartlettia fontana, and Bryobeckettia bartlettii; the hepatic Colura pulcherrima var. bartlettii; and the lichen Megalospora bartlettii. The flowering plant Metrosideros bartlettii also bears witness to his collecting prowess. Despite a growing passion for lichens John's first love was mosses, and in 1982-83 he spent several months in Alberta (Canada) with Dale Vitt working on a monograph of Blindia. However, between 1979 and 1984 he had added nine genera and fifty-five species to the New Zealand lichen flora, as well as adding to known records of several hundred others.

Besides all of this botanizing done as a part-time amateur over the last dozen years, John Bartlett was also a capable pianist and devotee of the design, structure, and repertoire of the pipe organ. He read widely on many subjects, and in several languages including Maori. His loss to South Pacific lichenology is inestimable; those who knew him as friend will never forget him. Fortunately, his voluminous collection of bryophytes and lichens has been deposited by his father at the Auckland Institute and Museum (AK). In due course they will be made available for researchers to borrow.

--- Alan J. FIFE and David GALLOWAY

Peter CHILD (New Zealand): 1922-1986

Peter Child was the brother of John Child who worked with William Martin on the book "Lichens of New Zealand" (A. H. & A. W. Reed, 1972). In his early 60's, he died last April following a massive heart attack just three weeks after being diagnosed with angina. His last day was spent in the Dunstan Range near his home collecting a pack full of lichens.

Peter was Biology Master at Dunstan High School in Alexandra, and became interested in lichens in the early 1970's when his brother began photographing for his book. He was a respected climber and member of the Otago Section of the New Zealand Alpine Club, and had an unrivalled knowledge of the western mountains from Haast Pass to Milford Sound. He was also an expert on the birds of the Otago high country, and well regarded in ornithological circles having published several papers.

The 1985 publication of Galloway's New Zealand flora refired his enthusiasm for lichens, and in May of that year he was collecting (and bird-watching) in the mid-Waiatoto at a place aptly called Lichen Creek. In his lifetime Peter Child achieved distinction as a teacher, mountaineer, and ornithologist. But he also was a discerning collector of lichens in an area notable for the diversity and richness of its flora. His were the first discoveries of Cetraria delisei and Ramalina pollinaria from the Old Man Range. A joint paper with Jack Elix on the discovery of a new Chondropsis species is in press.

Peter Child's death has denied us what might have been a stimulating written account of the lichens of Central Otago. He will be sadly missed. But his collections have been given by his wife Margaret to the DSIR Botany Division herbarium at Lincoln (CHR).

--- David GALLOWAY

Books

The British Ascomycotina: An Annotated Checklist. P. F. Cannon, D. L. Hawksworth and M. A. Sherwood-Pike. CMI/CAB in collaboration with the British Mycological Society. viii + 302 pp. ISBN 0-85198-546-7. 1985. Price: $100.00.

This limited edition unique reference work endeavors to include all ascomycete names and their synonyms reported from the British Isles since pre-existing group listings (e.g., pyrenomycetes (1940), discomycetes (1951), lichenized groups (1980)). About 1,300 genera and 7,300 species are listed and account, respectively, for some 1,100 and 5,100 accepted names. Records are updated to conform with modern taxonomic treatments and the 1981 Sydney Code which established 1753 as the starting-point date for all fungi with the exception of sanctioned Persoon and Fries names. The publication dates for all generic and specific names are provided, along with generic type species and references to identification literature and (where known) anamorphic states. Each genus is referred to an order and family where appropriate (following the 7th edition of Dictionary of the Fungi (1983) and other recent ascomycete classifications), and all cited synonyms and anamorph names are cross-indexed. Notes on host and/or substratum ranges and distributions are included -- many being first time such reports for species in the British Isles. Two appendices provide a synopsis of genera grouped by families arranged alphabetically under orders, and a tentative anamorph-teleomorph listing. The text is completed by an extensive bibliography citing approximately 1,500 references.

From a lichenological point of view, there exists justification for a revised checklist of Ascomycotina names following only five years after H, J & C (1980). An ongoing explosion of taxonomic publications has caused a significant number of name changes to take place (see recent ILN reviews). The heterogeneity of Lecidea species, in particular, has been reduced by 1/3rd since James (1965) checklist, and Hafellner (1984) is pressuring for further generic change. Many older microlichen names that adorn folios of early European collections are now in vogue or undergoing modification: for example, Amygdalaria, Lecidella, Psilolechia, Pyrrhospora, and Steinia have been joined by Carbonea, Lecidoma, Melanolecia, Mosigia, and Placynthiella. Between James and H, J & C an approximate 45% increase in the number of British Ascomycotina genera known to possess lichenized members has occurred. Since then the number has remained fairly constant with revisions countering additions/deletions. Other microlichen genera that have undergone change include Bryonora, Epigloea, Farnoldia, Gloeopyrenia, Megalospora, Ropalospora, Sporostatia, Thelenella, Tornabea, Trimmatothele, and Tylothallia. Following European tradition Parmelia sensu lato is left intact, but one macrolichen genus all have just become accustomed to is recognized as superseded: Physciopsis (formerly Physcia) is now correctly Hyperphyscia -- is nothing sacred anymore?

Hawksworth explains the 1976 origin to this book and the early difficulty in getting funding. A 3-year University of Liverpool grant from the Science and Engineering Research Council finally enabled funding of a post-doctoral assistant. Following publication of the 1980 "lichen-forming, lichenicolous and allied taxa" list, first Martha Sherwood and then Paul Cannon were employed. Post a 1982 manuscript completion, financial aid towards publication costs was received from the British Mycological Society. A proposed new flora fully documenting the British lichens is in the works (see elsewhere in this Newsletter), but it will not be ready before 1989-90 at the earliest. This 'Checklist of Ascomycotina', with its much more pertinent information, should help bridge the gap between H, J & C, current generators of revised lichen taxonomies, and their user market.

Whether this text will be used as a working list or reference volume is most likely to be determined by its cost -- exorbitant! But it is a milestone in both lichenological and mycological terms. Those lacking the personal resources should, without doubt, recommend its purchase by their reference library, botanical laboratory, or research herbarium. Production quality is excellent, and other than a few missing "dubious" species, the absence of Leprocaulon seems to be the only lichenological typographic faux pas. The use of computerized data entry for laser composition phototypesetting obviously pays off! [Note: Members of the British Lichen Society benefit from a reduced purchase price of $66.00 if the text is bought directly from: Commonwealth Agricultural Bureaux, Farnham Royal, Slough SL2 3BN, England, U.K.].

Flora of New Zealand Lichens. David J. Galloway. P. D. Hasselberg, Wellington (N.Z. Government Printer). With 8 figures (all color plates). lxxiii + 662 pp. ISBN 0-477-01266-3. 1985. Price: NZ$39.95.

Publication of this book represents a major step for Australasian and Southern Hemisphere lichenology. It is the first definitive flora for the Antipodes to be published in this century. It brings together not only what was previously a burdensomely incomplete and scattered literature but also typification of many taxa whose types lie buried in European collections. More than ten years of research by the author both in the field in New Zealand and in libraries and herbaria of the Northern Hemisphere were required to complete the project. Without the help of the British Museum (Nat. Hist.) and its staff this project would never have been completed.

New Zealand probably has one of the best preserved, richly-diverse, and interestingly developed lichen floras left in the world today. It is a center of speciation for such macrolichen genera as Siphula (11), Megalospora (12), Placopsis (12), Sticta (13), Menegazzia (17), Psoroma (30), and Pseudocyphellaria (46), but has a very poorly understood microlichen flora. The last major account of New Zealand lichens was Zahlbruckner's "Lichenes Nova Zealandiae" published postumously in 1941 based largely on the collections of H. H. Allen and J. Scott Thomson. The current book discusses some 960 taxa in 210 genera which the author feels may represent about 60% of the country's lichen flora (ca. 2,000 species). Its format follows that established for phanerogamic volumes of the Flora of New Zealand. The main taxonomic section is preceded by a brief explanatory preface, a history of lichenological exploration, a superb bibliographic annals on taxonomic research for the 1781-1983 period, abbreviation codes, and a list of collectors and the location of their herbaria. A choice was made not to include a discussion of lichens as whole organisms, but to direct readers to appropriate publications on lichen biology.

The systematic part is introduced with a bracketed key to genera that includes couplet reversal numbers and page references for each taxon elucidated. This cross-references well with the text body in which the literature citations, diagnoses, and discussion of each genus are followed by species keys and brief species descriptions. Generic arrangement is strictly alphabetical with no proposal of any formal classification, and the author has deliberately applied a rather broad species concept. Species notes list biogeographical designation, N. Z. distribution, and additional pertinent information including suspected taxa for groups in need of further study. In keeping with the current Australasian lichenological trend, all recently proposed or reintroduced genera have been accepted, including segregates of Lecidea and Parmelia sens. lat. With respect to many microlichen groups this flora provides the only English-language summary of such recent shifts.

Galloway's aim was to have quickly available a working flora "warts and all" that could act as the basis for informed future fieldwork. This he has done! Illustrations are limited and not up to par with color plates from recent European lichen handbooks; but appropriate sources (e.g., Martin & Child) are cited. Some minor inconsistencies occur between key characters and species descriptions, and the color reactions of thallus spot tests could have been more fully expressed for some taxa. But the glossary is excellent and the volume of data presented unsurpassed. It is this latter fact (along with the exhaustive typification completed) that make this work so significant. And its style and level of presentation does not preclude its use by the interested amateur.

Only two lichen genera (Calycidium and Thysanophoron both in the Caliciales) are known to be restricted to New Zealand, but roughly 45% of the cited species are said to be endemic. Although most are probably more widespread within Australasia and require confirming collections, these two figures alone hint at the geographical relationships, age, and isolation of the area. Some ten biogeographical elements are recognizable for New Zealand's flora, but at least four (endemic, Australasian, Austral, and southern xeric) link its lichens with those of other antipodal countries. Thus -- this text is much more than a regional handbook and not meant to be an end point in itself. It should be treated as a challenge to all those lichen enthusiasts living in the Southern Hemisphere to get out and about and solve the many floristic questions raised.

David no one could have done this essential first step better! Congratulations on a very successful piece of work!

A Guide to the Literature for the Identification of North American Lichens. Irwin M. Brodo. National Museums of Canada, Ottawa, Ontario K1A 0M8. Syllogeus 56. 39 pp. ISSN 0704-576X. 1985. Price: free!

This new bibliography for identifying lichens has some 360 entries, and attempts to guide users to the literature on various categories of lichens and every lichen genus known to occur in North America. References found most useful in lichen determinations are grouped according to: general articles and books; geographic regions; crustose, foliose, and fruticose genera and species; and individual generic treatments.

The work attempts to fill the void for North America that is so well served by Hawksworth's and Santesson's respective lists for Britain and Scandinavia. In the past it has been very difficult for beginning students of American lichenology to "get into" the literature. This booklet updates earlier listings by Culberson and Imshaug and should prove a very useful tool for all lichen specialists.

It is available free of charge from: Information Center, National Museum of Natural Sciences, National Museums of Canada, Ottawa, Ontario K1A 0M8, Canada or by writing Ernie BRODO.

Die Jugendentwicklung von Flechten - ein Indikator fur Klimabedingungen und Umweltbelastung. Gunter Schuster. J. Cramer, Vaduz [Bibliotheca Lichenologica, Bd. 20]. 112 figures and plates. 206 pp. ISBN 3-7682-1420-6. 1985. Price: DM 80.

This thesis done under Prof. Dr. H. M. Jahns deals with the developmental stages of just two lichens under varied environmental conditions. Hypogymnia physodes soredia and Usnea filipendula thallus fragments were studied over a period of 12 months or more, attached to various substrates within differing microclimatic regimes at several sites within two chosen areas of Germany. Transplants of whole lichens were also made between the locales, the Frankfurt Botanic Garden having considerable SO_2 pollution while the Spessart Mountains (50 km E of Frankfurt) acted as a clean control area.

Results show that the thallus data are exacting but are discussed with reference to microclimatic data which are more limited. Schuster found that studies of soredia were more useful than those of thallus fragments for comparing differing environments, especially as the times required for apparent results were far shorter. Development was followed by means of scanning selected electron microscope samples. Microclimatic measurements were made of humidity, light intensity, and air/thallus temperature along with thallus water content determined through electrical conductance. The most interesting results concerned stages in the development of lichen samples at the mountain control sites. It was possible to distinquish phase sequences for both species up to the development of corticate thalline lobes, although the sequence differed slightly between the species. At the pulluted Frankfurt site most of the transplants degenerated and soredium production was severely limited.

The book is an interesting addition to autecological lichen studies, but the results could have been compacted and explained more precisely. Many readers will probably become frustrated with trying to ascertain the facts from the text. This approach to environmental assessment undoubtedly deserves serious attention and will be of use to those interested in monitoring air pollution. The electron micrographs and illustrations are of good quality.

Lichens. Jack R. Laundon. Shire Publications Ltd. (Shire Natural History Series. No. 10), U.K. With 31 illustrations and 3 tables. 24 pp. ISBN 0-85263-811-6. 1986. Price: £1.25.

The new Shire Natural History series aims to provide concise accounts of current knowledge on single specialist subjects for the beginning student or informed layperson. Bee Orchids, Buttercups, Fungi, Gorse, and Willows are other botanical titles released so far. Laundon's delightful contribution is generously illustrated (only six figures being in black and white) and covers history, form, reproduction, habitats, esthetics, pollution, economics, collection and identification of lichens. It packs within its 24 pages more than most amateurs would think to ask.

The concepts of lichen, symbiosis, and chimera are discussed along with their geologic age. Growth form, photobionts, and structure are elucidated. Sexual and vegetative reproduction is contrasted and related to an explanation of primary-secondary species pairs. The dual role of conidia is explained. Lichen habitats are discussed in relation to substrate types and the history of the British flora. The esthetics of lichen cover and its susceptability to polluted air, acid rain, and heavy metals is detailed. And

the traditional role of lichen as dye, perfume, food and medicinal sources is summarized. The book concludes with brief notes on how to collect, preserve, and identify both living and dried specimens.

Did you know that lichen-like organisms existed in Precambrium times and played a role in the formation of gold deposits? Had you realized just what effect lead runoff exerts on developed lichen colonies (see figure 27)? When did you last check a graveyard headstone like that shown on the cover? This is a great little book and should be read by all budding lichenologists. If only all countries had an amateur natural history system like that of the British Isles!

Likenjo de Okcidenta Europo. Illustrita Determinlibro. G. Clauzade & C. Roux. Societe Botanique du Centre-Ouest [Bulletin, Nouvelle Serie, Numero Special 7], Royan, France. With 405 figures and 6 tables. 893 pp. ISSN 0154 - 9898. 1985. Price: FFr 450.

This profusely illustrated set of keys to the lichens of Western Europe is dedicated to the memories of both French lichenologist Dr. M. Bouly de Lesdain and Dr. L. L. "Esperance" Zamenhoff the Russian philologist and creator of the Lingvo Internacia. Apart from a brief preface in French, the entire script comes in Esperanto and is accompanied by a suggested source of dictionaries for 10 European languages (Anglia, Dana, Finna, Franca, Germana, Hispana, Islanda, Nederlanda, Portugala, k. Sveda) for those in need of help!

A sixty-page introductory part covers the general biology of lichens discussing morphology, anatomy, reproduction, spore types, identification practice, the role and identification of algae, and the techniques of lichen chemistry. A series of nine generic keys, broken up into growth-form units, then precede the taxonomic part which is arranged alphabetically by genus. A short bibliography and a very complete index are accompanied by a group of 'appendices' that explain common Esperanto lichenological terms and (including an errata sheet) needed postscript name changes.

More than a dozen years have passed since the publication of Les Lichens: Etude biologique et flore illustree (Ozenda & Clauzade, Paris, 1970) and considerable research has rendered "Le Clauzenda" somewhat obsolescent. Recent lichenological studies in the Western Alps, Mediterranean region, Poland, Portugal, Netherlands, Ireland, and Great Britain have helped improve knowledge of the French flora, leading to this current publication. Initiated in 1980 as progress towards une nouvelle flore des lichens de France, the text became modified as systematics progressed and nomenclature changed over the later years. This temperate flora now covers northern Europe from Scotland to central Scandinavia, southern Europe from the Iberian peninsula to Sicily, and central Europe from Ireland to Austria. Subtropical affinities as might be encountered on the Azores are not included.

Intending this "Illustrita Determinlibro" to be a distinct identification manual, the authors abandoned use of photographs in favor of diagrams and sketches as more effective identification aids (and less onerous production problems) for such a book. They explain their rationale for using Esperanto as a desire to overcome the ambiguities between the languages of European users through its providing a minimum of unfamiliar words. Obviously, without the help of the numerous colleagues cited, neither the text nor the illustrations would have been realized. Most of the

illustrations have not been published before, and while some are limited and/or still confusing (e.g., in Pertusaria) others are extremely useful (e.g., in Verrucaria).

This exhaustive book discusses some 330 generic/subgenic categories and defines approximately 3,600 species and segregates. The authors describe one new genus (Zamenhofia), one new species (Verrucaria zamenhofiana), six new subspecific catergories in four genera (Caloplaca, Diploschistes, Lecanora, and Porina), offer one new name (Staurothele lesdainiana for S. nigrescens B. de Lesd. nom. iilegit.), and make 152 new specific/subspecific combinations in 46 genera. A truly monumental work that accepts many of the more recent microlichen taxonomies authored by Europeans, yet takes a more conservative approach to macrolichen genera authored/accepted by non-European lichenologists (often citing these in synonomy).

An order form for obtaining this most informative book from the SBC-O Publications Service, "Les Andryales", St-Andre, F-17550 Dolus, France is included with this Newsletter as a GREEN flyer.

Liquenes Antarticos. Jorge Redon Figueroa. Instituto Antartico Chileno, Santiago. With 91 figures in 21 plates (38 in color). 121 pp. Inscripcion No. 61989. 1985. Price: Es. ?

This modern treatize by Jorge Redon on the maritime Antarctic lichens is dedicated to Otto L. Lange and represents the summation of some 15 years of study. Already well known for his contributions to the lichen flora and vegetation of Chile, the author presents a survey of lichens from the South Orkney Islands and Antarctic Peninsula surrounds (Tierra de O'Higgins from Canal Jorge VI to the South Shetland Islands).

Introductory material on the nature, structure, reproduction, physiology, chemistry, ecology, uses, and taxonomy of lichens makes the text of general appeal. It concludes with useful discussions of the main lichen communities, distribution patterns, and evolutionary implications of the flora. Certain genera produce a disproportionate number of endemics. An extensive glossary and bibliography complete the book.

A treatment of 47 genera and 119 species from the area forms the core of the publication. This contrasts with the 86 genera and 424 species accepted by C. W Dodge in his 1973 Lichen Flora of the Antarctic Continent and Adjacent Islands. Redon's nomenclature is relatively modern and he includes only one new taxon: Pertusaria epibryon nom. nov. for Lecanidium antarcticum Dodge (non P. antarctica Mull. Arg.). He stresses that many species described for Antarctica are likely synonymous and that the high species estimates are probably in error. Unfortunately, Joy Walker's monograph on Usnea subg. Neuropogon -- a group of importance to the area -- was published too late to be included (see review in ILN 18(1/2): 18-19).

A master key to the genera precedes an alphabetical treatment. Generic diagnoses are followed by species descriptions with notes on ecology and distribution, appropriate comments, and references to published descriptions. Keys to species within genera are provided when necessary and prove easy to work. The special value of this book, however, is in the

accompanying community and habit photographs. Many are in color and reproduced close to the real life situation (with captions in English for those who can't read Spanish). They complement well the fine color illustrations given by Rex Filson in his 1966 The Lichens and Mosses of McRobertson Land.

The author has successfully produced a fine aid to all who work on maritime Antarctic ecosystems.

A New Guide to Microchemical Techniques for the Identification of Lichen Substances. F. Joy White & Peter W. James. British Lichen Society (BLS Bulletin 57 Supplement), London. With 3 figures and 4 tables. 41 pp. ISSN 0300 - 4562. 1985. Price: £1.50.

This revised guide by White (ex Walker) and James updates their 1980 supplement published as Bulletin 46: 13-29 of the British Lichen Society. They feel that amateurs and practicing lichen taxonomists still deserve relatively simple aids for the determination of lichen products, despite the growing availability of sophisticated techniques (like HPLC, mass-spec, and UV absorption spectrophotometry) that make isolation and identification of lichen substances the province of the specialist organic chemist. Information gained from these more esoteric investigations has led to a wider and better diagnosis of lichen compounds demonstratable by the older microchemical techniques of chromatography, thallus color tests, and UV fluorescence. The authors summarize their findings generated over many years of herbarium research.

As for paper chromatography, microcrystal tests are now of historic interest only having become outmoded by improved thin layer chromatographic methods, better solvent systems, and the availability of pure substances. The aim of this work is to offer the more specific details of TLC and other microchemical techniques lacking in surveys of lichen substances, create an easily referable laboratory manual, and provide a guide to the interpretation of results obtained. In fact, the authors provide much chemical information that is not otherwise readily available. And, as a service to members of the British Lichen Society, have commensed the compilation of a chemical checklist to the British Lichen Flora. This will be published in parts in the BLS Bulletin beginning with a Summer 1986 (Volume 58) issue on Parmelia.

The manual begins with a general consideration of taxonomic and ethical issues surrounding the use of chemical testing -- the latter being especially significant. It then considers thallus spot testing with C, K, KC, CK, P(D), and nitric acid. Questions of reagent ageing, substance concentration and location, reaction time, and use of indirect testing are discussed. Microscopic preparations for thallus color tests, investigation of fruit body pigments, and detection of amyloid substances are dealt with next. The various roles for spot test agents and differing iodine solutions are considered. Polarized light (with or without the use of solubilizing infusion agents) can also prove of benefit in investigating apothecial inclusions.

We discover that ultra-violet fluorescence may be applied to whole thalli and to developed chromatographic plates either before or immediately after charring. The best lichen TLC requires either pre-coated aluminum or glass silica gel plates. The former are cheaper and easily cut to size, the latter essential for fatty acid detection. Plastic-backed plates are of use only if detection involves non-charring. Plate preparation techniques and the role of various mixed solvent systems are discussed in detail. Substance

extraction, plate examination, and the recording of TLC results are carefully explained. Table 4 (in six parts at the back of the publication) lists relevant TLC data for some 115 common lichen substances. Finally, tricks for successful analysis of fatty acids, separation of lecanoric from gyrophoric acid, and the detection of triterpenoids are provided. The text concludes with a presentation on the use of two-dimensional chromatography and a relevant bibliography.

This is a laboratory technician's dream, and explains for the struggling student just what microchemistry is all about when dealing with lichenized fungi. The booklet should be essential reading for any credited course in lichenology.

SYMBIOSIS: An Introduction to Biological Associations. Vernon Ahmadjian & Surindar Paracer. University Press of New England, New Hampshire. With 56 figures and 21 halftones. ISBN 0-87451-371-5. 1986. Price: $32.50.

In the 19th century German mycologist Anton de Bary coined the word "symbiosis" to mean a living together of different types of organisms in a wide variety of relationships. Until recently most scientists still equated the concept only with mutualism -- a relationship from which both partners benefit. In reality, though, symbiosis has a broad reach from benign commensalism to deadly parasitism and it embraces many aspects of biology from all the kingdoms. Using symbiotic associations as the focus, the authors take us through an extraordinary variety of ecological settings exhibited by viruses, bacteria, protoctists, fungi, plants, and animals. Their holistic integrative approach shows symbiosis to be a fundamental driving force in coevolution, responsible for such milestones as the origin of the eukaryotic cell, as well as some of mankind's most devastating diseases.

The greatest virtue of this book as a comprehensive introductory text is its breadth of coverage of the biological sciences. By presenting such a perspective, the authors are able to bring together instances of symbiosis ranging from classical observations to the modern experimental approaches of molecular biology. From glimpses of microbial predation to the takeover of entire ant colonies by other ants, we begin to see the cellular, chemical, behavioral, and community levels of this ubiquitous phenomenon. Basic concepts, definitions, and an overview of symbiosis are covered in the first chapter; succeeding chapters detail examples from the various kingdoms. Brief introductions provide specialized terminology and information relevant to each biological field. Each chapter ends with a "Summary and Perspectives" section, study questions, and selected readings. Ample illustrations and box-essays interspersed throughout the text make it enjoyable to read. The book concludes with theoretical aspects of symbiosis and its evolutionary implications, and an appendix on the historical landmarks leading to the new science of symbiology.

Symbiosis is directed at a new generation of teachers, students, and researchers who want to broaden their perspectives beyond the narrow focuses of traditional biology. With time, the significance of the authors' work in compiling this text will become obvious to course instructors at all levels of the educational system. Indeed, now that the book exists, many may wonder how they ever taught without it. As an undergraduate text or supplemental graduate reference, the book should interest students of botany, behavioral-, cell-, and micro-biology, ecology, mycology, parasitology, and medicine. And to those interested in the biological control of pests and disease processes, the book's coverage of both pathogenic and nonpathogenic symbiotic systems

should prove useful. With the advent of biotechnology and genetic engineering, clear knowledge of such systems holds great promise for the future prevention of disease.

Ideally, one can hope that a formalized study of symbiosis will become part of the "new" biology curriculum (incidentally improving the lot of lichens as biological systems). From this will grow the hard science of symbiology with its own postulates and derivations, leading to subfields such as "applied symbiology" with all its implied ramifications. Indeed, lichenologists are already aware of such developments with the 1985 initiation of SYMBIOSIS: An International Journal edited by Margalith GALUN from Tel Aviv (see review in this Newsletter). Ahmadjian & Paracer can rest assured that their intent has already found a market.

Die Toxizitat von Zink, Schwefel- und Stickstoffverbindungen auf Flechten-Symbionten. Jakob Marti. J. Cramer, Vaduz [Bibliotheca Lichenologica, Bd. 21]. With 15 figures and 64 tables. 128 pp. ISBN 3-7682-1426-5. 1985. Price: DM 50.

Despite the many publications now appearing on the use of bioindicators, this paper offers a novel approach to studying how lichens are affected by pollutants by examining the behavior of isolated symbionts in pure culture. Thirty-three Swiss species were utilized and the author was successful in isolating viable bionts in almost all cases. Toxicity of symbionts was investigated with respect to sulphate/sulphite, nitrate/nitrite, zinc, temperature, and pH. Measurement was examined by studying the incorporation of $^{14}CO_2$.

Sulphite adversely affected both mycobionts and photobionts but not to the same extent. A 2hr exposure to 5mM sulphite reduced the chlorophyll content of Parmelia caperata's alga by 30%. Both mycobionts and photobionts were also affected by nitrite but with an enormous spread of relative sensitivities. Lichen fungi characteristic of nutrient-rich habitats were scarcely affected while photobionts from species associated with acidic barks showed ^{14}C uptake reduced by up to 80%. The effects of various factors on soredia germination and development from Hypogymnia physodes were also studied, concluding the 1970s pioneering work of Margot. Of particular interest are the results of Larix bark extracts taken from different parts of Zurich. Small pH variations produced marked effect; 80% soredia germination on extracts of pH 3.9 but only 39% on ones of pH 3.3. The results for this are mapped and indicate a very practical application to biological monitoring.

The major experimental results are discussed on a species-by-species basis and considered in relation to taxon sensitivity to sulphur dioxide and substratum pH. Marti concludes that the most suitable indicators for low levels of SO_2 and nitrogen oxides are Parmelia caperata and Usnea florida which possess very sensative symbionts. Medium level pollutant detectors are Physcia stellaris, Ramalina fastigiata, and R. pollinaria while high pollutant concentration biomonitors are Hypogymnia physodes, Parmelia acetabulum, P. sulcata, and Xanthoria parietina. Many results are in accord with field studies, but differences were found for some species which the author then cautions against for use in bioindication; for example Anaptychia ciliaris, Lobaria pulmonaria and Physconia distorta. However, one must not relate isolated biont data directly with field studies. Thallus loss in culture may mean that pollution-avoidance strategies like thallus shape, cortical structure, or substratum buffer have been overidden. And in biont culture tests with short exposure times, no allowance is made for the natural ability of intact thalli to recover after pollution episodes.

This work merits the attention of all concerned with pollution estimation using lichens, for it makes an important contribution to our knowledge. But data conclusions need to be placed in context. Although the lichens used in this study are well known, the species and strains of photobiont may well vary within a single 'lichen' species. In most cases in this report the author does not appear to have determined the photobionts with which he was dealing.

Membership

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ASPERGES, Michael	Onderwijslaan 87, B-3610 Diepenbeek, BELGIUM.
GOMEZ-BOLEA, Antonio (and associates)	Dept. de Bot./Fac. de Biol., Universitat de Barcelona, Ave. Diagonal, 645 08028 Barcelona, SPAIN.
GOWARD, Trevor	Box 131, Clearwater, British Columbia VOE 1NO, CANADA.
KYRIACOPOULOS, Tatiana	Institute of Systematic Botany, Biology Dept., University of Athens, Panepistimiopolis, 157 84 Athens, (Hellas) GREECE.
LAMBLEY, Peter	Biology Department, The University, P. O. Box 320, Port Moresby, PAPUA NEW GUINEA.
The Library	National Museum of Wales, Cardif CF1 3NP, WALES (U.K.).
The Library	Royal Botanic Gardens, Mrs. Mac-Quarrie's Road, Sydney, NSW., AUSTRALIA.
SOCHTING, Ulrik	Institut for Sporeplanter, University of Copenhagen, Oster Farimagsgade 2D, DK-1353 Copenhagen K, DENMARK.
WINGFIELD, Robert	Apartardo 7357, Coro, Falcon, VENEZUELA.

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