#### **INDEX**†

\* Denotes a new taxon, a new combination, a new rank or a new name.

Ahmed, H. M., 292-304 Airborne fluorides, 26-32 Alectoria, in the British Isles, 181-261 -, key to, 202–204 Teretiuscula (Hillm.) D. subgen. Hawksw., 201 A. bicolor, 204-209 A. capillaris, 209–213 \*f. fuscidula (Arnold) D. Hawksw., 211 A. chalybeiformis, 213-216 A. fuscescens, 217-222 -f. pallida (Savicz) D. Hawksw., 218 - var. positiva (Gyeln.) D. Hawksw., 219 A. lanestris, 222-224 A. nigricans, 224–228 A. nitidula, 228–231 A. ochroleuca, 231-235 A. pubescens, 235-238 -f. subciliata (Nyl.) D. Hawksw., 236 A. sarmentosa subsp. sarmentosa, 238-243 - vexillifera, 243–246 A. smithii, 246-249 A. subcana, 249–252 \*A. trichodes (Michaux) D. Hawksw., 252–253 A. vrangiana, 253-255 Anaptychia ciliaris, 283-291, 467-469 Anglesey, 368-400, 401-422 Anthracothecium leucostomum, 275-282 A. libricolum, 275-282 A. ochraceoflavum, 275–282 Apothecia of Peltigera rufescens, study of, 59-88 Arctomia deliculata, 114-115 Arthonia impolita, 33–44 A. radiata, 33-44 Arthropods, 434-443 Asci, further examples of the bitunicate type, 275-282 of Peltigera rufescens, histological study of, 59-88 Ascospores, electrostatic charge on, 311-313 -, liberation and dispersal, 33-44 Bacidia friesiana, 115–117 \*B. pruinosa P. James, 117–119 B. rubella, 33–44, 311–313 B. sublubens, 120 Baddeley, M. S., 18-25, 283-291 Baeomyces roseus, 1–10 Beltman, H. A., 349-367 Biatorella, in the British Isles, 120-124 -, key to, 123-124 B. microhaema, 120, 122 B. pinicola, 120-122

Bitunicate asci, 275–282 Blyth, 11-17 Book reviews, 178-180, 342, 481-487 Brightman, F. H., 476-477 Brittany, field meeting in, 149-169 Brown, D. H., 305-310 Buellia canescens, 283-291 B. erubescens, 125 B. griseovirens, 125-126 B. punctata, 33-44 \*Byssoloma subdiscordans (Nyl.) P. James, 126-127 Calidia rhizophora, 175 Caloplaca herbidella, 127-128 C. luteoalba, 470-471 Candelariella reflexa, 129–130 C. xanthostigma, 130 Chapman, D. S., 51–58 Chloride content, 305–310 Chromium content, 423-433 Cladonia, variations in ontogeny of fruiting bodies of, 349-367 C. alpestris, 292-304 C. arbuscula, 18–25 C. botrytes, 349–367 C. coccifera, 349-367 C. coniocraea, 349–367 C. cristatella, 1–10 C. deformis, 292–304, 349–367 C. digitata, 349–367 C. foliacea, 349-367 C. furcata, 349–367, 423–433 C. impexa, 18–25, 349–367 C. macilenta, 349-367 C. mateocyatha, 1–10 C. miniata, 349–367 C. mitis, 292-304 C. parasitica, 349–367 C. rangiferina, 292–304, 349–367 C. strepsilis, 1–10 C. squamosa, 349-367 C. subrangiformis, fumarprotocetraric acid in, 175–176 C. subtenuis, 1-10 Copper content, 292–304, 423–433 Coppins, B. J., 149–169, 326–336 Cornicularia aculeata, 18–25, 423–433 Crustaceous saxicolous lichens, method for estimating dry weights of, 314-316 Cyanophilic lichens, 444-451 Dart, River, 305-310 Dibben, M. J., 1-10

† Compiled by M. R. D. Seaward

#### Vol. 5

\*Diploschistes diploschistoides (Vain.) G. Salisb., 273 Distribution maps of lichens in Britain, 51-58, 121-122, 181-261, 464-480 Enterostigma, typification of, 319-320 Epiphytic lichens, influence of local maritime conditions on, 305-310 Erme, River, 305-310 Evernia prunastri, 18-25, 283-291 Ferry, B. W., 18-25, 283-291 Field and study notes, 175-177 Field meetings: Brittany, 149-169 Leicester, 170-174 Northumberland, 337-341 Richmond, 326-336 Finegan, E. J., 18-25, 283-291 Fletcher, A., 314-316, 368-400, 401-422 Fluorides, 26-32 Fort William, 26-32 Garrett, R. M., 33–44, 311–313 Gerson, U., 434–443 Gilbert, O. L., 11-17, 26-32, 337-341 Hawksworth, D. L., 51-58, 170-174, 179, 180, 181-261, 321-322, 342, 345-348, 452-456, 481-483 Heathland, lichen ecology of, 423-433 Heavy metal content, 292-304, 423-433 Henssen, A., 444-451 Hong Kong, 321-322 \*Hypogymnia laminisorediata D. Hawksw. & Poelt, 452-454 \*H. madeirensis (Tav.) D. Hawksw., 455 H. physodes, 18-25, 283-291 \*H. tavaresii D. Hawksw. & P. James, 454-456 Imshaug, H. A., 317-318 Iron content, 292-304, 423-433 Iskandar, I. K., 45-50 Jahns, H. M., 349-367 James, P. W., 89-91, 114-148, 175, 467-480, 483-486 Jenmania, 445–448 J. goebelii, 446–447 \*7. osorioi Henss., 447-448 Kappen, L., 323-325 Lallemant, R., 59-88 Laundon, J. R., 175–176, 177, 486–487 Lead content, 292–304, 423–433 Lecanora campestris, 33-44 L. chlarotera, 33-44 L. conizaeoides, 33-44 L. dispersa, 33-44 L. muralis, 33-44, 423-433 \*L. symmicta var. sorediosa Westm., 457-460 L. verrucosa, 141 Leicester, field meeting at, 170-174 Letrouit-Galinou, M-A., 59-88

17 galls, arthropod-induced, 436 - resistance to arthropod feeders, 436-437 Lichina, 448-451 \*L. minutissima Henss., 449-450 \*L. polycarpa Henss., 450-451 Littoral lichens, ecology of, 368-400 Manganese content, 292-304, 423-433 \*Melanophloea pacifica P. James & Vězda, 89-91 Meo, J. A. di, 305-310 \*Micarea chrysophthalma P. James, 131–133 \*M. leprosa P. James, 133–135 Microglaena antarctica, 275–282 Microthelia aterrima, 275–282 M. biformis, 275–282 M. hassei, 275–282 M. thelena, 275-282 Mimetics and camouflage, 437-439 Mineral accumulation, 423–433 Morgan-Jones, G., 275–282 Mycoblastus, in the British Isles, 135–138 , key to, 137–138 M. fucatus, 135-137 Negev, Western, 323-325 Nickel content, 292-304, 423-433 — smelter, 292–304 Nieboer, E., 292–304 Northumberland, field meeting in, 337-341 Obituary, 345–348 Opegrapha atra, 33–34, 311–313 O. lyncea, 472–473 O. prosodea, 474-475 Pannaria mediterranea, 138–139 Parmelia acetabulum, 283–291, 476–477 P. caperata, 283–291, 305–310 P. perlata, 305–310 P. saxatilis, 11-17, 18-25, 283-291 P. soredians, 478-480 P. subrudecta, 283-291 P. sulcata, 18-25, 283-291 Parmeliella corallinoides, 139 Peltigera rufescens, 59–88, 423–433 Pertusaria bryontha, 141 P. glomerata, 141 P. trochiscea, 139-141 pH, effects on respiration, 18-25 Physcia adscendens, 283–291 Physconia pulverulenta, 283–291 Phytotron, whole lichen culture in, 1-10 Polyblastia, in the British Isles, 92-113 -, key to, 96–98 P. agraria, 99–100 P. albida, 102-103 P. allobata, 101-102 \*P. cruenta (Körb.) P. James & Swinsc., 110

Lichen desert, studies along the edge of, 11-

- P. cupularis, 107–8 P. deminuta, 104
- P. dermatodes, 100–101

P. gelatinosa, 103 P. helvetica, 100 P. inumbrata, 109-110 P. nigritella, 104-105 P. quartzina, 106 P. scotinospora, 111 P. sendtneri, 107 P. terrestris, 108-109 P. theleodes, 111-112 P. tristicula, 98-99 P. verrucosa, 106-107 P. wheldonii, 105 \*Porina coralloidea P. James, 142-145 P. olivacea, 144 Pseudevernia furfuracea and its chemical races in Britain, 51-58 Psocids, lichen communities destroyed by, 177 Puckett, K. J., 292-304 Pycnidial production in culture, 6-7 Pycnothelia papillaria, 1–10 Pyrenula nitida, 275-282 Ramalina farinacea, 283–291 R. fastigiata, 18–25, 283–291 R. maciformis, 323–325 R. usnea, typification of, 317-318 Respiration, 18-25, 283-291 Richardson, D. H. S., 292-304 Richmond, field meeting at, 326-336 \*Rinodina interpolata (Stirt.) Sheard, 461-463 Rocky shores, 368-400, 401-422 Rose, F., 467-480 Salisbury, G., 262-274, 319-320 Sarcogyne regularis, 33–44, 311–313 \*Schismatomma niveum D. Hawksw. & P. James, 145-147 Schulze, E.-D., 323-325 Scunthorpe, 423–433 Seaward, M. R. D., 423–433, 464–466 Sheard, J. W., 461–463 Sowter, F. A., 176 ----- obituary of, 345-348 Steelworks, 423-433 Stereocaulon paschale, 292-304

Sudbury, 292–304 Sulphur content, 423–433

Sulphur dioxide, effects on respiration, 18-25 - effects on cover, 11–17 Supralittoral lichens, ecology of, 401-422 Swinscow, T. D. V., 92-113, 178-179 Syers, J. K., 45-50 Temperature, effects on respiration, 18-25 Thallus of *Peltigera rufescens*, histological study of, 59–88 Thelotrema sect. Thelotrema, 262-274 T. allosporizum, 273 T. aquilinum, 271 T. cavatum var. dolichosporum, 272 T. gibbosum, 273 T. isidiophorum, 268–269 T. lepadinum, 267–268 T. lepadodes, 270–271 T. porinoides, 265-266 \* T. saxicola (Vain.) G. Salisb., 269-270 T. sordidescens, 319-320 \*T. subdenticulatum (Zahlbr.) G. Salisb., 267 T. subtile, 263-264 \*\_ - subsp. japonicum (Zahlbr.) G. Salisb., 264 \*Tricharia santessonii D. Hawksw., 321-322 Tromera, key to, 123-124 Trypethelium eleuteriae, 275-282 T. virens, 275-282 Umbilicaria deusta, 292-304 U. muhlenbergii, 292-304 U. vellea, 292-304 Usnea fragilescens, 18-25, 283-291 Vegetative growth in culture, 4-6 Vězda, A., 89-91 Water solubility of lichen compounds, 45-50 Westman, L., 457-460 Xanthoria parietina, 283-291, 311-313

Zinc content, 292-304

#### DATES OF PUBLICATION

Vol. 5, Parts 1/2 : October 1971 Vol. 5, Parts 3/4 : November 1972 Vol. 5, Parts 5/6 : October 1973

#### 490



# The Athlone Press UNIVERSITY OF LONDON

## **Air Pollution and Lichens**

edited by B. W. FERRY,

M. S. BADDELEY and D. L. HAWKSWORTH

This new volume reflects the particular concern of many biologists for the effects of air pollution on the environment and illustrates the special values of lichens as plants suited to such studies. In a wide coverage which includes much previously unpublished data, the book emphasizes the logical progression from field observational studies to critical laboratory investigation of the modes of action of air pollutants on the living tissue of lichens. It will serve both as reference volume and as an encouragement to further work.

The editors' fellow-contributors are: B. J. Coppins, J. F. Farrar, E. J. Finegan, O. L. Gilbert, F. N. Haynes, P. W. James, J. R. Laundon, J. Margot, D. I. Morgan-Huws, T. H. Nash III, L. C. Pearson, K. J. Puckett, D. H. S. Richardson, F. Rose, P. J. W. Saunders and C. M. Wood.

485 11140 3 55 line figs.

£6.25

# JOURNAL OF BRYOLOGY

Formerly Transactions of the British Bryological Society

Edited by H. L. K. Whitehouse

The *fournal of Bryology* publishes original articles on all aspects of the study of bryophytes from any part of the world, including their morphology, anatomy, ultrastructure, physiology, taxonomy, cytology, genetics, ecology, geographical distribution, and fossil or subfossil remains. Mosses and liverworts, although of little economic importance, are particularly suitable for the study of some aspects of plants. As they are the simplest green plants with stems and leaves, and can be grown in pure culture or defined media, they are appropriate for studying the physiology and genetics of differentiation. They are also of exceptional interest cytologically, being the group in which heterochromatin was first described. Ecologically, they are of great importance, not only because of the significant, or even dominant, part they play in the flora of many areas, but also because many of them are excellent indicators of the nature of the substratum and of pollution.

The Journal of Bryology is published twice a year at £4.00 (\$12.00) per annum post free.

### Blackwell Scientific Publications Ltd Osney Mead, Oxford OX2 OEL

# **Botanical Monographs**

A series edited by

#### J.H. Burnett, H.G. Baker, H. Beevers and F.R. Whatley

There is increasing awareness of the significance of plant studies both for the development of general biological ideas and in the context of an increasingly food-conscious world. This series of books seeks to present authoritative accounts of important topical, developing, or neglected areas in the plant sciences taken in their widest sense and including both pure and applied aspects. The monographs are intended to challenge and inform the advanced worker while providing the undergraduates with a readable and stimulating text. Each monograph is designed as a concise treatment of a topic, complete in itself. Published in association with the University of California Press, sole distributor in the U.S.A. and Canada.

#### 9. The Biology of Blue-green Algae

Edited by N.G. Carr B.SC. D.PHIL. and B.A. Whitton B.A. PH.D. 1973. 686 pages, 146 illustrations. £13.50

The volume presents an account of the biochemistry, physiology, morphology and ecology of this major group of prokaryotic organisms. Over twenty chapters, written by research workers active in quite diverse fields, emphasize an interdisciplinary approach to the subject. Particular attention has been directed to giving a balanced description of structure and physiology. Their important environmental roles, their part in nitrogen fixation and the biochemistry of phototrophic metabolism are some of the attractions of bluegreen algae to an increasing number of biologists. This book, extensively illustrated and thoroughly referenced, will provide the source material for students, and experienced as well as new research workers should find it of great value. A series of short appendices summarize details of culture collections, media and some specialized aspects of growing blue-green algae.

#### 10. Algal Physiology and Biochemistry

Edited by W.D.P. Stewart B.SC. PH.D. 1973.

960 pages, 75 illustrations. £15.50

This book provides an up-to-date review of knowledge in the field of the physiology and biochemistry of algae. It is intended for honours students, researchers and teachers of phycology, plant physiology and biochemistry, aquatic biology, microbiology and environmental biology. It is contributed to by the following 35 experts who have provided a review article on their particular research fields of interest. R. A. Lewin (California); R. D. Preston, W. Mackie (Leeds); M. Jost (Michigan); T. Bisalputra (British Columbia); L. Bogorad (Harvard); T. W. Goodwin (Liverpool); L. V. Evans (Leeds); R. Sager (New York); J. S. Craigie (Halifax); W. Nultsch (Marburg); B. Moss (Newcastle-upon-Tyne); M. Dring (Belfast); G. E. Fogg (Bangor); I. Morris (London); A. Kuhl (Gottingen); J. C. O'Kelley (Alabama); W. M. Darley (Georgia); E. A. C. Macrobbie (Cambridge); Govindjee (Illinois); R. P. Levine (Harvard); E. Kessler (Erlangen-Nurnberg); J. A. Raven (Dundee); D. Lloyd (Cardiff); N. E. Tolbert (Michigan); M. R. Droop (Oban); B. R. Green (British Columbia); G. E. Soeder, E. Stengel (Dortmund); J. A. Hellebust (Toronto); H. Lorenzen, M. Hesse (Gottingen); B. Wood (Strathclyde); L. Provasoli (Yale); A. F. Carlucci (California).

#### 11. Plant Tissue and Cell Culture

Edited by H.E. Street. 1973. 480 pages, 175 illustrations. £12.50

The potentialities of plant tissue and cell culture for studies on many aspects of cellular physiology and in plant breeding and rapid vegetative propagation are now widely recognized. Important recent advances in culture techniques can confidently be expected to result in their even wider use in the future. At this time, therefore, there is an urgent need, particularly for advanced undergraduates, graduate students and research workers wishing to assess how far such culture could aid their investigations, for an authoritative, up-to-date and working account of the techniques involved and a critical assessment of previous and current work. The various authors have contributed chapters covering the fields of their own research interests, provided essential practical details of technical procedures, and an assessment of how far these techniques are of wide or only restricted application and have reviewed the more important new knowledge arising in their field for the use of tissue and cell cultures. Individual chapters deal with cell suspension and callus cultures, single cell cloning and selection of mutant cells, cytology, studies on growth and metabolism, organogenesis and embryogenesis, culture of protoplasts and studies in plant pathology.

## Blackwell Scientific Publications

Oxford London Edinburgh Melbourne -

#### INSTRUCTIONS FOR AUTHORS

Papers and short notes from contributors anywhere in the world are welcome for consideration for publication in *The Lichenologist* and may be on any aspect of lichenology.

Manuscripts must be typewritten on foolscap or A4 size paper in double or treble spacing with 1 inch margins all round and should be submitted in duplicate to the Editor. Contributors should retain a copy of their paper for checking the proofs.

Line illustrations must be in black ink on stiff white card, preferably Bristol board.

As a guide to the layout of synonymy, references, etc., recent issues of the journal should be consulted. The spellings of locality names in Britain and abroad must follow those of the most recent editions of maps published by the Ordnance Survey and *The Times Atlas of the World*, respectively. Titles of periodicals should be abbreviated as in the fourth edition of the *World List of Scientific Periodicals* and its supplements. In lists of references the publisher and place of publication of books should be given; editions other than the first should be indicated.

of publication of books should be given; editions other than the first should be indicated. Twenty-five reprints of original articles are supplied free. More may be purchased, as may reprints of other contributions such as book reviews. Reprints must be ordered when the author returns the proofs of his article.

Books dealing with any aspect of lichenology will be reviewed. Publishers wishing to have works reviewed in *The Lichenologist* should send them to the Assistant Editor in the first instance.

This journal is covered by Current Contents and Biological Abstracts.

#### NOTICE

While the Editor and Assistant Editor endeavour to check the accuracy of statements in contributions in as far as they are able, it should be emphasized that views expressed in papers in *The Lichenologist* are those of their authors and do not necessarily represent those of the British Lichen Society, the Editor or the Assistant Editor.

#### REFEREES

The function of referees, whose names appear inside the front cover, is to assist members of the British Lichen Society in the identification of lichens. Specimens submitted should be adequate in size and well documented, including details of country, county or vice-county, borough or parish, precise locality and grid reference, altitude, date, habitat and ecology, notes, name of collector and collecting number. Identification should be attempted before sending material to a referee and details of spores and chemical reactions included where appropriate. Members wishing to send large numbers of specimens to a referee should first of all check that he is willing to name their collections for them. Return postage should always be included.

#### MEMBERSHIP

Membership of the British Lichen Society is open to all persons anywhere in the world interested in any aspect of lichenology. Subscriptions, due on joining and afterwards on 1 January each year, are: ordinary members,  $\pounds 3$ ; junior members,  $\pounds 2$ ; family members  $\pounds 0.25$ . Details of membership, activities of the Society and application forms may be obtained from the Secretary, Mr J. R. Laundon, Department of Botany, British Museum (Natural History), Cromwell Road, London SW7 5BD, England. Members receive the *Bulletin* of the British Lichen Society and issues of *The Lichenologist* published in the year they join, and afterwards while they remain members of the Society, free of charge.

#### THE LICHENOLOGIST

1973

#### Vol. 5 Part 5/6

HAWKSWORTH, D. LObituary, Frederick Archibald Sowter 1899-1972	345-348
JAHNS, H. M. and BELTMAN, H. AVariations in the ontogeny of fruit-	
ing bodies in the genus <i>Cladoma</i> and their taxonomic and phylogenetic	349-367
FUETCHER, A.—The ecology of marine (littoral) lichens on some rocky	
shores of Anglesey	368-400
FLETCHER, A The ecology of maritime (supralittoral) lichens on some	and the second
rocky shores of Anglesey	401-422
SEAWARD, M. R. D Lichen ecology of the Scunthorpe heathlands	
I. Mineral accumulation	423-433
GERSON, ULichen-Arthropod associations	434-443
HENREEN A -New or interesting evanophilic lichens I	444-451
HAWKSWORTH, D. L.—Two new species of Hypogymnia (Nyl.) Nyl.	452-456
WESTMAN I -Notes on the taxonomy and ecology of an arctic lichen:	strat/ol
Lecanora symmicta var. sorediosa Westm.	457-460
Surapp I W Rinoding interpolata (Stirt.) Sheard, a new combination	
in the British and Scandinavian lichen floras	461-463
Distribution many of lighting in Britain	464-480
Distribution maps of lichens in britain	481-487
Book Reviews	199 100
Index and suggested with a response of the development of the second state in relation of	400-490

#### © British Lichen Society 1973

c/o Department of Botany, British Museum (Natural History), Cromwell Road, London SW7 5BD

Published for the British Lichen Society by Blackwell Scientific Publications Ltd, Osney Mead, Oxford OX2 OEL

Free to members of the British Lichen Society

Annual Subscription £4.00 (\$14.00), post free

Published October 1973

Printed in Great Britain by Western Printing Services Ltd., Avonmouth, Bristol