Lichens, Bryophytes and Air Quality

Edited by Thomas Nash and Volkmar Wirth [*Bibliotheca Lichenologica 30*] J. Cramer, Berlin. 297 pp. DM 90.

Did you know that lichens and bryophytes are one hundred times more efficient than flowering plants at accumulating atmospheric pollutants like sulphur dioxide? Read on.

Lichens, Bryophytes and Air Quality is the end-product of a symposium held at Grand Forks, North Dakota in 1983. It is also the first comprehensive North American review of lichens, mosses and liverworts as bioindicators. Although its contents are now slightly out-of-date (most contributions cover only to 1985), it remains the most extensive summary of its kind.

Of the twelve authors who have contributed to this volume, only one, Keith Puckett, hails from Canada. Nevertheless, it is interesting to note that considerable research has been performed in Canada using cryptogams as environmental monitors. Indeed, Canadian bryological studies apparently account for more than three-quarters of all North American research of this kind, perhaps reflecting the dominance of bryophytes peculair to Canadian forest ecosystems.

The book is divided into twelve chapters, including two introductory chapters, four on pollution monitoring, four on physiology, and two on the application of lichen and bryophyte research to regulatory decisions. High points for naturalists include: Chapter 1, in which Tom Nash and Bob Egan provide a minicourse on lichen and bryophyte biology; Chapter 2, in which Nancy Slack summarizes the ecological importance of these organisms; Chapter 7, in which Ray Showman sums up the results of fifteen biomonitoring studies using lichens; Chapter 7, in which Bill Winner does more or less the same for bryophytes; and Chapter 9, in which Winner et al. compare the absorption capacities of lichens and bryophytes with those of flowering plants, as noted above.

In addition, the final chapter will be of interest to conservationists. Here Lorene Sigal, in an article on the relationship of lichen and bryophyte research to regulatory decisions in the United States, signals new avenues of research which would make these organisms more useful in establishing air quality standards. At the same time she paints a helpful portrait of American legislation on air pollution.

The last pages of the book are devoted to a full and useful index that I found easy to use. Though the editors have not seen fit to include a glossary, this omission is partly compensated for by Chapter 1, in which most of the necessary terminology is introduced in bold print. Especially valuable to prospective researchers are the bibliographies which accompany each of the chapters; collectively these represent a highly detailed who's who and what's what in pollution studies.

In summary, *Lichens, Bryophytes and Air Quality* is a well-appointed primer for researchers wishing to use lichens and bryophytes as indicators of atmospheric degradation. The methodologies outlined in its pages should enable even nonspecialists to design and operate inexpensive monitoring stations in their neighbourhoods. For this reason alone, *Lichens, Bryophytes and Air Quality* should be required reading for anyone who wants to keep a finger on the pulse of environmental health.

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ENVIRONMENT

Changing the Global Environment: Perspectives on Human Involvement

Edited by: D. B. Botkin, M. G. Caswell, J. E. Estes, and A. A. Orio. 1989. Academic Press (Harcourt Brace Jovanovich, San Diego). 458 pp., illus. Cloth U.S. $49.95; paper US $24.95.

Changing the Global Environment is a selection of papers from an international conference held in Venice, Italy, in October 1985, dealing with the relationship between people and nature. As a result the authors invited to contribute papers to the book are noted international authorities for the subject areas covered. Each paper is provided with a helpful introduction to the author and subject matter covered.

The stated purpose of the book is a retrospective view to consider what mankind has learned, what mankind might be able to learn, and might do in the future. A large portion of the book has been devoted to the development of remote sensing, its impact now, and in the future. There is some mention of analytical advances other than remote