Book Reviews

A Paleohydrology Project

Handbook of Holocene Palaeoecology and Palaeohydrology. B. E. BERGLUND, Ed. Wiley-Interscience, New York, 1986. xxiv, 869 pp., illus., + foldout chart. $114. International Geological Correlation Programme Project 158B.

The International Geological Correlation Programme of the International Union of Geological Sciences sponsored a project called The Paleohydrology of the Temperate Zone during the Last 15,000 Years, and this book is the principal product of the portion of the project dealing with lakes and wetlands. The term "handbook" in the title implies that methods of investigation are emphasized, and indeed they are. But the book contains much more, including broad discussions of various problems in late Quaternary paleoecology. The opening chapter by H. J. B. Birks, for example, is a definitive review of the patterns of late-glacial and postglacial biotic changes in terrestrial and lacustrine environments in northwestern Europe.

The particular long-range goal of the project, as envisioned by Björn Berglund, its leader, was to subdivide the temperate zone into vegetation-landform regions and to establish for each region a primary paleoecological reference site in which all kinds of stratigraphic investigations could be made, in order to reconstruct in detail the environmental history for the region. Appropriate regions have been delineated throughout the Scandinavian countries, but not many reference sites have so far been studied there or elsewhere in the recommended detail, primarily because few Quaternary research groups have the resources or specialists to undertake the broad range of stratigraphic analyses proposed. This volume, however, details what could be done where conditions permit and what considerations should go into site selection, fieldwork, coring, sampling, laboratory procedures, numerical analysis and interpretation of results, and methods of presentation. A preliminary version of the handbook was initially published in 1979 by the Department of Quaternary Geology of Lund University and was widely distributed, but the present volume contains thoroughly revised chapters and several additional contributions.

Because so many students and professionals undertake lake-sediment and peat investigations with casual and imperfect knowledge of field and analytical techniques, results frequently have uncertain validity, and a handbook such as this will improve the quality of all kinds of research on these materials. For example, the lateral variability of sediment stratigraphy from shallow to deep water in a lake indicates the importance of careful selection of coring localities in a lake. Paleomagnetic and other methods of core correlation in transects across lakes are reviewed by J. Dearing. Such transects are necessary in reconstructing the history of lake-level changes, as described by G. Digerfeldt, who also evaluates in another chapter the pros and cons of various coring devices and procedures.

Several chapters in the book deal with dating methods, which are essential in any stratigraphic studies—radiocarbon and lead-210 dating (I. Olsson), paleomagnetic dating (R. Thompson), tephrochronology (Th. Einarsson), varves (M. Saarnisto), and tree rings (A. Munaut and W. Bircher). Among the fossil groups considered in separate chapters are pollen, charcoal, bryophytes, other plant macrofossils, diatoms, other algae, rhizopods, cladocerans, ostracods, beetles, chironomids, and mollusks, all treated by leading investigators. The final section of the book treats the numerical analysis of pollen-stratigraphic data, various methods of multivariate analysis, and problems in vegetational and climatic calibration of analytical data.

Like many other aspects of Quaternary research, studies of lake sediments and peat are highly interdisciplinary. Because of the pervading historical approach and the involvement of earth materials, geologists take the lead, and of the 43 persons listed as contributors to the volume 13 are associated with geological institutes or departments. But departments in 11 other fields are represented, including botany (seven contributors), limnology (five), geography (four), physics (four), ecology (two), biology (two), climatology (two), and archeology, palynology, forestry, and geophysics (one each). Another statistic of interest shows the international flavor of the authorship. Because of the editorship Sweden naturally leads the list with 11 authors, but England has nine, Switzerland and the United States four each, Poland three, Denmark, Scotland, Germany, and Finland two each, and Norway, the Netherlands, Belgium, and Iceland one each. The literature references accordingly provide an entrée to regional publications that American workers do not commonly see, and such exposure should enhance the quality of research in the broad field of Quaternary studies. As a handbook this volume leaves little to be desired, whether for the student who needs guidance in techniques or the professional who wishes the latest word on calibration of radiocarbon dates, the numerical analysis of stratigraphic data, or microscopic analysis of unfamiliar fossils. Each chapter represents the state of the art in the analysis of the numerous physical, chemical, and biological components of lake sediments and peat. The book is nicely produced and easy to handle. Despite the stiff price, it belongs in every library and laboratory concerned with the subject.

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Extracellular Connections

Gap Junctions. MICHAEL V. L. BENNETT and DAVID C. SPRAY, Eds. Cold Spring Harbor Laboratory, Cold Spring Harbor, NY, 1985. xvi, 409 pp., illus. $70. From a conference, Cold Spring Harbor, NY, Oct. 1984.

There have been numerous advances in the study of gap junctions over the last few years, and the resultant accumulation of literature now warrants detailed consideration and assessment, as much to help the initiated sort out the state of the art as to enable those less intimately involved with the subject to discover how the field has progressed.

As the editors note in their introductory remarks, the present book is a progress report rather than the final story. There are in all 32 chapters from a range of workers in the field, producing a relatively comprehensive, rather than idiosyncratic, selection of topics. Among the major issues covered are the structure of gap junctions as studied by a variety of techniques, comparative biochemical analyses in different tissues, the production and use of gap-junctional antibody probes, the control of gap-junctional gating, the response of gap junctions to chemical signals, their importance in the exchange of information during development, and their integrative properties in excitable tissues. The detailed appraisals of the various studies included are in many cases more than will interest the non-expert—this is a tome primarily for the cognoscenti. As is often the case with multi-authored volumes, the editors were unable to impose a common style of presentation on the contributors. One is therefore confronted with a variety of approaches, but many chapters have neat concluding paragraphs that succinctly summarize the salient points of the preceding, often complex, arguments.

It is clear from this volume that controversies still rage round gap junctions and