

reader to go into a specific subject in more depth than covered in the text. Annoying but less serious problems are with the figures. Most of the line drawings are excellent and were printed in a readable standard format. A small number of drawings, however, are direct computer plots with tiny difficult-to-read labels and needless excess zeros behind the decimal point. Many of these are multifunction plots where individual lines are very difficult to distinguish from each other. Only a few plots are really terrible but they are certainly not for the farsighted. Some

of the letters are less than $800\mu\text{m} \times 500\mu\text{m}$, some of the plotted lines are actually less than a $100\mu\text{m}$ in width, and in places both plotted lines and figure borders totally disappear. The continuous tone photographs have poor tonal quality similar to newsprint.

Cosmic Dust is a comprehensive up-to-date book that will be of significant value to anyone working in fields involving interstellar grains. It contains a good coverage of the theory, observations and current state of understanding of dust in the interstellar medium. For someone just

getting into this interdisciplinary field it contains a wealth of suggestions for important future work. For the corner librarian this book will be a headache. Although *Cosmic Dust* is the first *Cosmic Dust* devoted entirely to interstellar dust, it is the third book with a jacket label of this title published in the past 15 years. □

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Forest ecosystem

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Pattern and Process in a Forested Ecosystem: Disturbance, Development and the Steady State Based on the Hubbard Brook Ecosystem Study. By F.H. Bormann and G.E. Likens. Pp.253. (Springer: Berlin, Heidelberg and New York, 1979.) DM42, \$23.10.

As the sub-title indicates, this book describes the work of the Hubbard Brook Ecosystem Study in northern New England. The authors' objective is to provide an integrated picture of the structure, function and development of an area of northern hardwood forest and to set their data against current concepts of ecosystem dynamics. In effect, this book is one of the most complete accounts of secondary woodland succession following clear felling so far to be produced.

The authors propose a four-phase biomass accumulation model of woodland development of reorganization, aggradation, transition and steady state. This differs from the familiar smooth-curve biomass accumulation model of Odum in that the initial 'reorganization' phase of up to 15 years is a period of net loss in biomass when total ecosystem respiration exceeds GPP, as is also the transition phase which precedes the final 'steady state', when total biomass oscillates about a mean. Most of the book is inevitably concerned with a discussion of the quantitative characteristics of the 'reorganization' and 'aggradation' phases as these have been the subject of the long-term study. Here can be found a wealth of data on biomass accumulation, productivity, hydrological and mineral cycles, species diversity and evolutionary strategies. The discussion of the 'transition' and 'steady-state' phases is necessarily speculative as no examples of primeval forest survive in New England and the authors estimate that in the absence of external catastrophic events it takes about 300 years for the steady-state phase to be reached by natural developmental processes.

Many authors in the last twenty-five years have questioned the classical Clementsian view of 'climax' vegetation, insisting that it represents no more than an unrealizable abstraction. This is based on the assertion that natural succession is inevitably truncated somewhere in the aggradation phase (of the present authors) by cyclical catastrophic events such as fire or wind-blow. This issue is fully examined in the light of the available historical and ecological evidence, and the authors conclude that so far as their study area is concerned the fire-rotation periods are far longer than would be needed to prevent natural development reaching the steady-

state phase and that climax forest would indeed have been a reality in pre-settlement times.

Throughout the book there are undertones of a Clementsian 'supra-organism' philosophy but these are not permitted to become unduly obtrusive. The authors freely acknowledge that much more is owed to A.S. Watt's concepts of pattern and process in vegetation, an approach that will meet with a sympathetic hearing from most British ecologists. □

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Sediment studies

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Coastal Sedimentation. Edited by D.J.P. Swift and H.D. Palmer. Pp.339. (Dowden, Hutchinson and Ross: New York. Distributed by Academic: New York and London, 1979.) \$34, £22.50.

In the words of Professor Fairbridge, Editor of the *Benchmark Papers in Geology*, the philosophy behind the series is "one of collection, sifting and rediffusion". The basic concept is to republish selected seminal papers on a chosen topic in their original form (with minor excision) enveloped in editorial comment.

This is designed to overcome the problems of a scientist trying to delve into original literature only to find that the important references are diffused through many journals, or that, in the case of the newer centres of learning, runs of journals are of too short a span to contain vintage papers.

The first of these problems is particularly acute in the field of coastal sedimentation which is reviewed in this particular benchmark volume. This is a topic which is of interest to a wide range of scientists, engineers and even ecologists and conservationists. These range from geographers, geologists, civil and

hydraulic engineers to marine ecologists and sailors. Thus, it is not surprising to find that the papers in this volume are reprinted from periodicals as diverse as the *Journal of Waterways and Harbors Division of the American Society of Engineers*, the *Bulletin of the Georgia (USA or USSR) Academy of Sciences*, the *Bulletin of the American Association of Petroleum Geologists*, the *Beach Erosion Board of the US Army Corps of Engineers*, and a symposium volume published by the National University of Mexico. Few scientists can claim to have such eclectic interests as to monitor all these publications. They must be too busy reading to do any work if they can.

The book reprints a total of twenty papers which have been arranged in four groups. Each group is preceded by several pages of comment and introduction by the editors.

The papers in Part I are concerned with the coastal equilibrium profile. They begin with a bowdlerized version of Fenneman's classic paper of 1902, twenty pages having been omitted from the original thirty-two. This is followed by several papers written by US geologists in the nineteen-sixties. Part II is concerned with coastal deposits, reprinting five papers describing certain North American beaches and shelves. Part III is headed "Studies of Fluid Motion" and reprints five papers ranging from "Bottom Currents during Hurricane Camille" to "Wind-Driven and