REVIEWS

Plant Fossils: The History of Land Vegetation. By Christopher J. Cleal and Barry A. Thomas. Fossils Illustrated Series, Volume 3. Woodbridge, United Kingdom: Boydell, 1999. 188 pages, 41 line illustrations, 128 plates. $110.00 cloth.

Cleal and Thomas have identified a gap in the paleobotanical literature. They state clearly that their book is meant to be neither "a palaeobotanical textbook nor an identification guide" but, instead, an illustration of "the sort of plant fossils that palaeobotanists deal with and the type of information that can be gleaned from them" (p. 1). The result is a generally readable overview of the plant fossil record (including evolutionary questions and practical issues such as taxonomy) with extensive illustrations—not a textbook but not quite a coffee-table book (although priced like one). The book is organized around major groups of fossil plants in their stratigraphic order of appearance. The sections within each chapter sketch particular taxa and provide a balance of information on the morphological characteristics of the group and their geographic and stratigraphic ranges. Discussions of particular fossil plant localities (e.g., Rhynie Chert) contain a nice mix of information on the history of the locality, its depositional environment, its preservation, and the composition of the fossil flora. The volume is focused largely on western European (particularly British) and North American material. The text provides some terminological definitions but would have benefited greatly from a glossary and a few strategically placed figures illustrating morphological features. Cleal and Thomas compiled an extensive section of 128 plates documenting examples of difficult plant groups, including many of the classic specimens. I often found myself wishing that the plates were in color, both for aesthetic reasons and also because color plates would have helped the novice reader develop a better sense of the rock matrix and preservation of the fossils. Annette Townsend has drawn a series of line-drawing reconstructions based on original scientific publications. These are clear and accurate and constitute a major strength of the book. Finally, the text would have benefited from a final round of editing. Some mistakes are merely amusing, such as the pronoun mix-up in the explanation of plate 113: "The fruits were edible, like berries, for their coprolites have been found containing their chewed up remains." However, in other places, the mistakes are factual, such as in the legend to figure 39, which states that the three line drawings are "reconstructions of the flowers of a Late Cretaceous angiosperm, *Silvianthecum*," when, in fact, the leftmost flower is drawn from a published reconstruction of *Manningia*.

HALLIE J. SIMS
Department of Paleobiology
National Museum of Natural History
Smithsonian Institution

Glacial Lake Missoula and Its Humongous Floods. By David Alt. Missoula, Mont.: Mountain, 2001. 208 pages, 58 colored maps and illustrations, 45 black-and-white photographs. $15.00 paper.

Glacial Lake Missoula and Its Humongous Floods will be useful to anyone with an interest in the natural history of the Ice Age Missoula floods. Alt writes in the same clear, easily accessible style that brought him so much success in his contributions to the popular Roadside Geology series, which like this book, is published by Mountain Press. His book is organized in a chronological progression of 30 vignettes that start with the lake itself and end at the Pacific Ocean. Disappointingly absent, however, is any mention of the flood features off the continental shelf that have recently come to light (e.g., G. G. Zuffa, W. R. Normark, F. Serra, and C. A. Brunner, "Turbidite megabeds in an oceanic rift valley recording Jökulhlaups of Late Pleistocene glacial lakes of the western United States," *Journal of Geology* [2000] 108:253–274). It is, in fact, on the continental shelf where most of the thousands of cubic kilometers of flood-scoured soil and rock finally came to rest. Alt's intimate knowledge and more than 30 years of experience with glacial Lake Missoula, to which the first half of the book is devoted, is well expressed. But some of the names and accounts of flood features along the Channeled Scabland and the Pasco Basin are inaccurate and misleading in their interpretation. The wealth of geologic literature published about these regions indicates that details on the mechanics and frequency of flooding are still open to debate. To Alt's credit, he warns us that too many flood features are succumbing to development and makes it clear that remaining features need to be protected and preserved. He also does an admirable job of acknowledging the existence and importance of the many pre-Wisconsin flood episodes that preceded the more renowned last-glacial floods. And finally, Alt points out humanity's myopia in

regard to climate change: despite our immediate anthropocentric fears of global warming, he argues, a return to glaciation and renewed flooding is inevitable.

BRUCE BJORNSTAD
Applied Geology and Geochemistry
Battelle–Pacific Northwest National Laboratory

Ancient Invertebrates and Their Living Relatives. By Harold L. Levin. Upper Saddle River, N.J.: Prentice Hall, 1999. 358 pages, black-and-white figures. $68.00 cloth.

Levin's text is a solid introduction to invertebrate paleontology. Each of the 13 chapters begins with an outline and concludes with review questions and further readings. The first two chapters build a paleontological framework (geologic time, taphonomy, taxonomy, and evolutionary mechanisms) and address some areas of study (mass extinctions, evolutionary faunas, paleoecology, adaptations, paleoclimate, and tectonic reconstruction). Chapter 3 addresses Proterozoic life and the Cambrian explosion. The remaining chapters are taxonomic, covering the Protictista, Cnidaria, Bryozoa, Brachiopoda, Mollusca, Arthropoda, Echinodermata, and Graptolites and other Hemichordates. The chapters, which are well illustrated with clear drawings and black-and-white photos, contain sections on "the living animal," taxonomy, natural history, and geologic history. The trilobite coverage is particularly strong, beautifully illustrating a disparity of shapes. The text is most concerned with descriptions of phyla and, therefore, hardly mentions relationships or comparisons among phyla. Levin includes a token description of protostomes and deuterostomes when discussing the origin of arthropods, but there is no mention of the ecdysozoan-lophotrochozoan split, an advance in our understanding of Metazoan relationships that is now standard in invertebrate zoology texts. *Ancient Invertebrates* is suited for its intended audience: undergraduates with a background in geology but little exposure to biology. It would also be a useful supplement for an advanced paleontology class that includes students from different academic backgrounds. *Ancient Invertebrates* is brief and thus necessarily skips the details on which a specialist thrives, but it always includes the key concepts and, for the most part, only uses the most essential vocabulary.

REBECCA M. PRICE
Department of Geophysical Sciences
University of Chicago
