BOOKS: PALEOCLIMATOLOGY

The View Through the Rocks

Lisa Cirbus Sloan

Those of us interested in the history of Earth's climates have several books that we must own and consult often—Bradley's *Quaternary Paleoclimatology* and Crowley and North's *Paleoclimatology* (*1*) spring to mind. Bradley examines paleoclimate indicators and methods for studying them from the data-rich perspective of the last two million years; Crowley and North provide a broad education on understanding past climates from theoretical and observational points of view. To this valuable set of resources we can now add Judith Totman Parrish's *Interpreting Pre-Quaternary Climate from the Geologic Record*, which brings a strong geologic perspective to the topic and offers a thorough census of the use of rocks and fossils to decipher the record of pre-Quaternary climates.

Interpreting Pre-Quaternary Climate from the Geologic Record
by Judith Totman Parrish
Columbia University Press, New York, 1999. 354 pp. $95, £76. ISBN 0-231-10206-2.

Researchers and students will want to own this book for the sheer volume of information it contains. Parrish put a tremendous effort into compiling and summarizing the work of the many scientists who have contributed to reconstructing pre-Quaternary climates. Readers will learn much about biotic and lithologic indicators of ancient climates in marine, terrestrial, and freshwater environments.

In an introductory chapter Parrish outlines her view of paleoclimatology and provides some background information. Her account offers a very traditional, geologic perspective. For example, Parrish intentionally gives computer modeling of past climates short shrift. It is interesting to me (perhaps because I use a variety of paleoclimate models in my own research) that she chooses to downplay paleoclimate modeling at a time when this approach is becoming an increasingly accepted, appreciated, and applied method for investigating Earth's history. The choice, however, is consistent with her opening dedication, which mentions undeserved views of sedimentary geology and paleontology as "old-fashioned" and "static." It also suggests Parrish's bias that rocks are the beginning and end of paleoclimatology. Her view is apparent in the dedication and acknowledgments and the overall tone of the book, revealing one of Parrish's goals: to demonstrate that geologic and paleontologic data have an important place in the evolving field of paleoclimatology (a point that I doubt anyone would dispute).

The background information includes material on atmospheric circulation, paleogeography, time and correlation, and an introduction to paleoclimate indicators. Although these are a very necessary beginning to the book, the brief treatment of climatology is a bit thin. Some discussion of jet streams, storm tracks, snow lines, and lapse rates—among other details that influence climate on continental and regional scales and thus affect geologic records of climate—would have been a welcome addition. Including more climatology would also have provided readers with more appreciation of the nuances of paleoclimate interpretations.

In the next four chapters, which form the bulk of the book, Parrish discusses biotic and lithologic indicators of paleoclimates of marine and terrestrial (plus freshwater) settings. For each of the indicators she describes and analyzes, Parrish summarizes who has studied what. These chapters present a great deal of information, and they will bring any reader up to speed with a fairly quick read. Although Parrish provides commendable coverage of a broad range of geologic indicators, she gives only slight consideration to the uncertainties inherent in interpreting past climate characteristics from these indicators.

A short chapter examines paleoclimate models and their place in paleoclimate studies. After a nice introduction to the topic, Parrish devotes too much attention to parametric models, which have seen limited use and acceptance by the paleoclimate modeling community. Her discussion of the types of numerical models is fairly succinct, and she provides the references to consult for necessary additional information. The short segment on model-data comparisons is very good. Readers would have benefited from an extended treatment of this subject, especially one balanced by additional consideration of the uncertainties associated with the various types of geologic data. Parrish concludes the book with brief discussions of some integrative, interdisciplinary case studies.

Interpreting Pre-Quaternary Climate was written for geologists. It is an excellent textbook for courses focused on broad-scale paleoclimates from a geologic perspective rather than paleoclimate dynamics, but it would be a solid corollary text for the latter. A basic grasp of paleoclimatology from a climatic perspective will help any who consult the book. Parrish offers a solid foundation for learning about the rich variety of geologic data available for understanding past climates.

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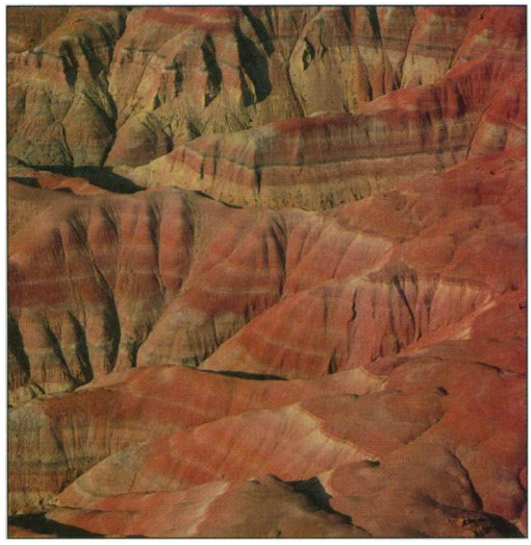
References
1. R. S. Bradley, *Quaternary Paleoclimatology* (Allen and Unwin, Boston, 1985); T. J. Crowley and G. R. North, *Paleoclimatology* (Oxford University Press, New York, 1991).



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BROWSINGS

Water, Earth, and Sky. The Colorado River Basin. *Michael Collier* et al. University of Utah Press, Salt Lake City, UT, 1999. 128 pp. $29.95. ISBN 0-87480-598-8.

Six essays on the ecology, rocks, and waters of landscapes from the Rocky Mountains to the Sea of Cortez are accompanied by Collier's revealing aerial photographs. As Parrish explains, the sediments and plants of the Chinle Formation, including these colorful shales exposed along Utah's Paria River, indicate a Late Triassic climate that was at least seasonally wet.