

A History of the Earth

by John J.W. Rogers, published by Cambridge University Press in 1993, ISBN 0-521-39480-5, 312 pages.

Review by Christopher G. Kendall

This book was largely written for first and second year graduate students in the geological sciences but it is also intended to provide an overview to scientists and laymen who have some knowledge of earth science but who need more background. The book covers a history of the earth and something of the processes that modify its crust through time. It ties crustal behavior with a broad understanding of stratigraphy, describing such things as the nature of the interior of the earth and the origins of life. The great strength of this book lies in its discussions of the global effects of mountain building on a local level, combining an understanding of plate tectonics with stratigraphy. As such, this text is a good source book on these aspects of earth history, however, I felt the focus of the book is on teaching these topics to a class of graduate students rather than to a general audience.

The book is composed of nine chapters. The first two chapters deal with geological time, how it is measured, the principal controls on crustal movement in terms of convection, the nature of the differentiation of the earth crust, the overall characteristics of the earth and its relationship to space, the effect of meteorites, thermal evolution and unstable isotopes. There is only a short discussion of sea level in rather general terms.

Next is the chapter on the character of the Archean and how it is differentiated from the overlying Proterozoic. It is focused on metamorphism and igneous activity, but records the existence of the earth's first sedimentary record, while discussing the Archean shield of Australia, India, Africa, etc. This is followed by a chapter on the rigid Lithosphere in terms of compression, subduction structures, generation of magma, island arcs, continental margins, and varieties of orogenic belts. It also discusses developing rifts, oceanic spreading, a variety of continental rifts and the development of plumes, etc.

Then is a chapter on Proterozoic in terms of its origin, its sediments and its various orogenic belts. There is discussion of these as associated with Africa, South America, the North American craton, Arabia, India, Australia, Antarctica and Eastern Asia. Magmatism, the stratigraphy of the Proterozoic basins, the various volcanic rocks and the origins of life are all touched on.

Then follows a chapter on the Paleozoic in terms of its life forms, climate, and the character of the ocean. Next is a chapter on the Paleozoic in terms of its tectonic history. A chapter on Mesozoic and Cenozoic the history of oceans and the climates, atmosphere and life. It is followed by a chapter on the formation of consumption, collision and the development of small ocean basins.

The book is well written though not as colorfully illustrated as some of the books that one can find on introductory geology. It is, however, aimed at higher level students and there is more meat to the text than the introductory books. It should not be viewed as a source book, unless you have an interest in tracing down the stratigraphy and geology of an ancient mountain chain, then this book could be for you. The illustrations are clear and the maps are largely simple line drawings. There are few photographs of rocks but most of the illustrations are in the form of maps, cross sections or drawings of organisms. It is my impression that this book represents a well written extension of John Roger's notes for his graduate students, reflecting

his interest in mountain building and its relationship to the stratigraphy of the earth.

The book's one major weakness is that it only touches on eustasy and its relationship to the sedimentary stratigraphy of the earth. This is a topic we are all faced with when considering the stratigraphic record and it should not have been so underplayed. It is not that sort of book that I would buy unless I was planning to take or teach graduate courses on plate tectonics and stratigraphy. Even then, this book could probably be just as useful to you in the library as on your shelves.