

## LITERATURE REVIEWS

*Readers are invited to submit reviews of current literature relating to origins. Mailing address: ORIGINS, Geoscience Research Institute, 11060 Campus St., Loma Linda, California 92350 USA. The Institute does not distribute the publications reviewed; please contact the publisher directly.*

### OLD TRADITIONS ON TRIAL

THE NATURE OF THE STRATIGRAPHICAL RECORD. Derek V. Ager. 1973. NY: John Wiley & Sons. 114 p.

*Reviewed by Ariel A. Roth, Geoscience Research Institute*

This is a delightful book. It is refreshing to find an author who is willing to question the well-established ideas that are too often taken for granted. Ager's basis for challenge comes both from extensive field observation and from the recent trends in geology towards catastrophic interpretations. These trends propose that a fair proportion of the sediments of the crust of the earth have been laid down by catastrophes with long periods of quiescence between.

The author, who is a well-recognized authority in the fields of paleoecology and stratigraphy, is well aware of the controversial nature of his presentation. However, he is unabashed and "unrepentant" (p xiii) and hopes his book "will stimulate thought and argument, even rage" (p xiv). Apparently this work is being well accepted. Other reviews in the literature (see list at the end of this review) are generally favorable. This is especially true of the most authoritative reviewers.

The impact of the argumentation in this book comes mainly from the broad spectrum of data referred to. This is not the usual pattern in scientific research where specialization is emphasized. Ager states, "Experts always tend to obscure the obvious" (p 7). A broad approach is important, especially in trying to make proper deductions from the more tentative data of the past history of the earth. The one serious criticism this reviewer has of the format of this work is that very few references to the data of the scientific literature are given in the text. At the end of the book an annotated bibliography is included, but such an arrangement is very unhandy for the serious student who wants to re-evaluate the specific data presented.

The author takes a strong stance in favor of catastrophism for the geologic history of the earth. He occasionally appeals to meteorites as a cause, even mentioning that a giant one "falling in the Atlantic would produce a wave twenty thousand feet high" (p 23). Some of his views fit in well with the Biblical account of earth history. He realizes this and

categorically dissociates himself from any such views. While referring to extraterrestrial causes he states,

*This is a heady wine and has intoxicated palaeontologists since the days when they could blame it all on Noah's flood. In fact, books are still being published by the lunatic fringe with the same explanation. In case this book should be read by some fundamentalist searching for straws to prop up his prejudices, let me state categorically that all my experience (such as it is) has led me to an unqualified acceptance of evolution by natural selection as a sufficient explanation for what I have seen in the fossil record (p 19, 20).*

This reviewer qualifies as a member of the lunatic fringe described above and happily notes that neither he nor other such qualified individuals are inmates of mental institutions!

The author begins the text by presenting evidence of unusually widespread sedimentary units relating a number of highly characteristic layers found on several continents. As an example, correlation is proposed between the colorful Painted Desert formation of the southwestern United States (Triassic, Chinle), with similar deposits as far away as the eastern seaboard of the United States, Spain, Germany, Bulgaria and the Atlas Mountains of Africa. He generally attributes the uniqueness of various deposits to climatic control, but also points to evidence for high energy conditions during deposition which can result in extensive transport. Widespread correlation even on a small scale is evident from lithological units of 100 feet or less in thickness in western Canada which persist for over 180,000 square miles.

Ager then addresses himself to the fossils. After recognizing the ubiquitous gaps in the fossil record, he adopts a catastrophic attitude toward evolution, where long periods of stable equilibrium are interrupted by rapid events of speciation. Ager has apparently not analyzed or does not accept the quantitative data (Eden 1967, Salisbury 1969) that indicates that the standard geological time scale is far too short a period for evolution to proceed even on a continuous basis. The author says more than he intends when he appropriately concludes by stating "palaeontologists cannot live by uniformitarianism alone" (p 26).

The inconsistency between the relatively rapid rates of deposition going on under present conditions compared to the thinness of the sedimentary layers of the earth which should be much thicker if the earth is very old is evidence to Ager that "the stratigraphical record is...one long gap with only very occasional sedimentation" (p 34). It may not have occurred to the author that if there are such long gaps between sedimentary events one should find at those gaps the evidence of the passage of time in the form of normal irregular erosional features, for if there is not sedimentation, there must be erosion. No place on the surface of our restless earth is free of the effects of one or the other of these processes.

In a chapter which is called “Catastrophic Stratigraphy,” an elegant defense for rapid action in sedimentation is put forth. The author speaks of graded beds 20 meters thick, deposited in a single “whoosh” of turbid water, and of the transport of “pebbles” over 40 meters in diameter. Such events are considered spasmodic. In the following chapter called “Catastrophic Uniformitarianism” the importance of these catastrophes is further emphasized. The author’s breadth of interest and spicy style is apparent in his statement, “The disastrous Lisbon earthquake of 1755 not only shook that city and the faith of the ‘Age of Reason’ (including Voltaire’s ever hopeful *Candide*), it also considerably modified the local sea-floor and its sediments” (p 46). Later he adds, “The hurricane, the flood or the Tsunami may do more in an hour or a day than the ordinary processes of nature have achieved in a thousand years” (p 49).

It is Ager’s opinion that a great deal of sediment deposition is in a lateral pattern instead of a slow, widespread vertical accumulation. This is used to explain the time transgressive (diachronous, or different age) deposits where within a sedimentary unit the fossil pattern of distribution is not parallel to the lithologic (rock layer) pattern. He also proposes to help solve the boundary disputes between various parts of the geological column by defining only the lower boundary of each unit, thus avoiding the argumentation over where the top of the previous unit ends. This would work quite well if the bottom of the units were well defined, but they are not.

Ager lists various possible mechanisms that may cause the catastrophes evident in the geological record. He gives due recognition to the paucity of modern parallels for what we see in the sediments of the earth, stating, “It can hardly be argued that either carbonate or coal measure deposition is going on around the world today in anything like the way it has in the past” (p 80). He suggests the possibility of extraterrestrial forces such as meteorites and changes in cosmic ray flux to explain geological and paleontological changes. He protects himself from the usual criticisms given these less testable hypotheses by appealing to the authority of other scientists with similar ideas: “I make no apology for joining a distinguished band of predecessors” (p 83).

The last part of the book is an attempt to synthesize the new ideas of plate tectonics with what is seen in the stratigraphical record. Here catastrophism is mentioned once more: “...and again, I think, we are beginning to see a somewhat ‘catastrophic’ picture” (p 83). He concludes his stimulating treatise by pointing out that the “history of any one part of the earth, like the life of a soldier, consists of long periods of boredom and short periods of terror” (p 100). We unhesitatingly propose that the long periods of boredom may not have been so long. It does not necessarily take very long for nothing to happen.

Anyone interested in the past history of this earth should read this book. The author's extensive field experience and breadth of knowledge are particularly valuable. He has accumulated an impressive amount of data in favor of catastrophism and his interpretations help to account for many features of the crust of the earth that have not been explained by generally accepted views. Perhaps an even greater contribution is that the author has shown that a number of older geological traditions can be challenged by factual data.

## REFERENCES

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