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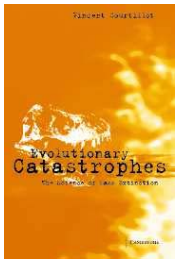
Evolutionary Catastrophes – *The Science of Mass Extinction*, by Vincent Courtillot (translated by Joe McClinton), 2007. Cambridge University Press, The Edinburgh Building, Cambridge, CB2 2RU, United Kingdom. Paperback (hardback no longer available), 188 pages, 17 line diagrams, 4 halftones. Price GBP 15.99; USD 24.99. ISBN 0521891183.



Who does not like horror stories? No wonder that also books on extermination of dinosaurs sell well. A first-hand description of the dispute on the causes of their extinction, initiated more than thirty years ago, with emotional intensity horrifying not less than the events 65 million years ago, is still available in paperback edition. Vincent Courtillot is a French paleomagnetist, highly respected not only in his own country, who had a good luck to work on the Deccan Traps in the proper time. This placed him among the prominent supporters of the volcanic cause of the Cretaceous/Tertiary dramatic changes in the biosphere. The description of how the conclusions were reached and confronted with views of the extraterrestrial party is vivid and instructive to non-geophysicists (I am among them). This is probably the main value of the book, contrary to its English title rather imprecisely describing its contents. Little is written in it about evolution, and the scientific level of its paleontological aspects is nicely expressed by an explanation in the glossary added to the book: “Bivalves: An animal, like a clam, that has two valves that open and shut (part of the mollusks).”

Vincent Courtillot argued against the extraterrestrial cause of all the major extinction events in the Phanerozoic Earth history and for their connection with volcanism, but his arguments loose some consistency while referring to the topic story of dinosaurs. He hesitated to reject the evidence of iridium anomaly and the Chicxulub crater, agreeing that the Deccan Traps contributed only partially to the global catastrophe. I guess that the recent results of research on a Chicxulub drilling core, showing that the meteorite impact had no influence on life even on local scale, gave him some satisfaction. But does this really matter?

Both the line of reasoning presented in the book and its misleading title expose the main flaws of the “science of mass extinctions.” Followers of this school of interpreting the fossil record want to find a simple catastrophic cause for any complex transformations of ecosystems in the geological past. Virtually any change in a single local succession of organisms recorded in the fossil record tends to be explained in global catastrophic terms. As if there were no migrations, no climatic zonations, no problems with biostratigraphic correlation, but as if ranges of fossils in rocks directly and literally represented all the complexities of the living world. It is understood that this view of the geological history is upheld by geophysicists, but to call such a distorted presentation “evolutionary” would be probably too much.

What we truly see in the fossil record near the Cretaceous/Tertiary boundary is hardly instantaneously catastrophic. Unusual and difficult to understand was not so much the termination of the complex world of Mesozoic marine ecosystems with ammonites, and of land faunas reigned by dinosaurs, but rather their earlier extremely long stable persistence. There were other cases of prolonged stability terminated by large-scale ecological disturbances: Late Ordovician glaciations mark a long-distance shifts of ecosystems and faunal migrations with an extent still difficult to decipher; the end of the Silurian to Devonian stromatolitic reefs was equally dramatic. But who knows the origins of the Llandovery, Famennian or Tournaisian pelagic faunas, much

easier to study than the evolution of continental organisms? Where all those conodonts and cephalopods were living earlier? To present these events just in terms of extinctions seems too simplistic. Near the end of the Cretaceous, in most of the well sampled marine sections clear signs of a lowering sea-level are recorded. Subsequently, the vast oligotrophic and taxonomically complex chalk-sea ecosystem, with coccolithophorid flagellates among the primary producers of biomass, was replaced by a high-productivity ecosystem with a low-diversity opportunistic assemblage, including dinoflagellates. Removal of the coccoliths from the sources of biogenic sediment reduced the sedimentation rate, thus immensely increasing the geological time representation in the rock. To call any increase of global productivity a catastrophe is idiosyncratic. If one wants to explain the end-Cretaceous extinction, a cause for this change in the global marine productivity should first be offered. Hardly having anything to do with extraterrestrial bodies, iridium anomalies or volcanic events.

From this point of view, the Chicxulub story appears highly instructive. Perhaps it is the proper time to read Vincent Courtillot's book again with a fresh eye.

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