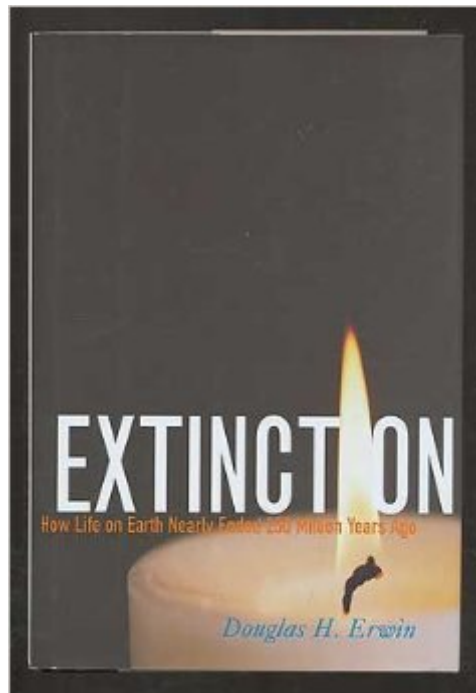


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# Extinction: How Life On Earth Nearly Ended 250 Million Years Ago



## Synopsis

Some 250 million years ago, the earth suffered the greatest biological crisis in its history. Around 95% of all living species died out--a global catastrophe far greater than the dinosaurs' demise 65 million years ago. How this happened remains a mystery. But there are many competing theories. Some blame huge volcanic eruptions that covered an area as large as the continental United States; others argue for sudden changes in ocean levels and chemistry, including burps of methane gas; and still others cite the impact of an extraterrestrial object, similar to what caused the dinosaurs' extinction. Extinction is a paleontological mystery story. Here, the world's foremost authority on the subject provides a fascinating overview of the evidence for and against a whole host of hypotheses concerning this cataclysmic event that unfolded at the end of the Permian. After setting the scene, Erwin introduces the suite of possible perpetrators and the types of evidence paleontologists seek. He then unveils the actual evidence--moving from China, where much of the best evidence is found; to a look at extinction in the oceans; to the extraordinary fossil animals of the Karoo Desert of South Africa. Erwin reviews the evidence for each of the hypotheses before presenting his own view of what happened. Although full recovery took tens of millions of years, this most massive of mass extinctions was a powerful creative force, setting the stage for the development of the world as we know it today.

## Book Information

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## Customer Reviews

In Kentucky, there's a museum with a lifesize model of a dinosaur with a saddle on it. This is a hymn in fiberglass to young Earth creationism, the idea that the Universe was created about 6,000 years

ago. It costs \$1,500 to become a charter member (family rate) of this museum. A much better investment would be \$24.95 for Douglas Erwin's thriller about the Permian extinction. More than nine-tenths of all species died out 251 million years ago. Erwin, a researcher with the Smithsonian Institution's National Museum of Natural History and the Santa Fe Institute, finds the end-Permian "enigma far more compelling than the end of the dinosaurs," a relatively minor event from 65 million years ago. For an event that Kentuckians think never happened, the end-Permian event left a lot of debris, of which the most interesting is in China. Until 20 years ago, the paleontological record there was unknown to the outside world. What the evidence is telling us is difficult to say. Erwin says "Extinction" was "frankly written as a mystery story." In this one, the clever detective does not wrap up all the loose ends on the last page. Instead, we learn that there are at least seven major theories of what might have happened. These range from a big meteorite to gigantic volcanic eruptions in Siberia to a climatic or biological or geological change that drove oxygen out of the oceans. The first chapters set the stage. Life was very different in the Permian. There were reefs in warm oceans, and they contained corals, but the corals were only distantly related to those of today and they were not as important as crinoids and lampshells, animals that still exist in out-of-the-way places.

Any scientist who opens [and closes!] a book by saying "We [I] don't know!" is worthy of your attention and respect. Too many others have taken up a theme and defended against all comers. Erwin's examination of the catastrophic close of the Permian Age is complete, admirably researched and exquisitely written. Within its pages, this work examines the various ideas on the massive loss of life 250 million years ago. These days, not to have heard of an meteor's killing off the dinosaurs 65 million years ago suggests you've lived hidden in a cave for a generation. Erwin opens with a brief overview of that event, reminding us that extinctions, particularly "impact events", have loomed large in discussions of the history of life ever since Walter and Luis Alvarez proposed the idea. It's easy to rattle off the numbers: when the dinosaurs "went West", perhaps 75% of life was also extinguished. When the Permian ended, over 95% of living things disappeared. Erwin asks: "How do we know this? What life forms disappeared? Did they all go at the same time? How long did it take to recover?" Most important, of course, "What killed them off?" Instead of dull statistics, Erwin asks the important questions. Acknowledging that "Triassic rocks are boring", he explains why this is so. Fossils are scarce is the obvious answer, but why they are missing is his quest. With most of his attention focussed on ocean life, he details what causes shifts in benthic populations. The seas rise and fall - for a variety of reasons. Glaciation takes up sea water and leaves continental shelves high and dry. Oceans need to "turn over" an oxygen supply. What is the result of that failing?

Carbon, with its various isotopes, passes through life selectively.

Even kids now can tell you about the mass extinction that wiped out the dinosaurs. When I was a kid, the dinosaur extinction was a big mystery, but there has been good evidence, now broadly accepted, that 65 million years ago a meteor as big as a mountain smashed into the Yucatan, turning everything for miles around into ash, wrapping the world in a cloud, and blocking the sunlight that runs all life. Everything all over the world changed, and we mammals got our try at reproductive success. The horrendous extinction that ended the Cretaceous age, however, wasn't the worst our old Earth had seen. 250 million years ago, there was an extinction that ended the Permian and began the Triassic periods (which is also the border between the larger, more general Paleozoic and Mesozoic eras). This Permo-Triassic event extinguished around 95 percent of all living species, and was as close as we have ever come to having all life wiped out. In fact, in the 19th century, geologists thought that life had been wiped out and a separate creation had occurred to start the Triassic. What really happened, and how, are the subjects of *Extinction: How Life on Earth Nearly Ended 250 Million Years Ago* (Princeton University Press) by Douglas H. Erwin, Senior Scientist and Curator of the Department of Paleobiology at the Smithsonian. He has made the end-Permian mass extinction his research interest for the past twenty years, and has traveled all over the world to the fossil beds and geologic boundary layers remaining from around the time of the catastrophe. Looking back so many millions of years ago is not easy, and the picture is not as clear as that of the dinosaur extinction.

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