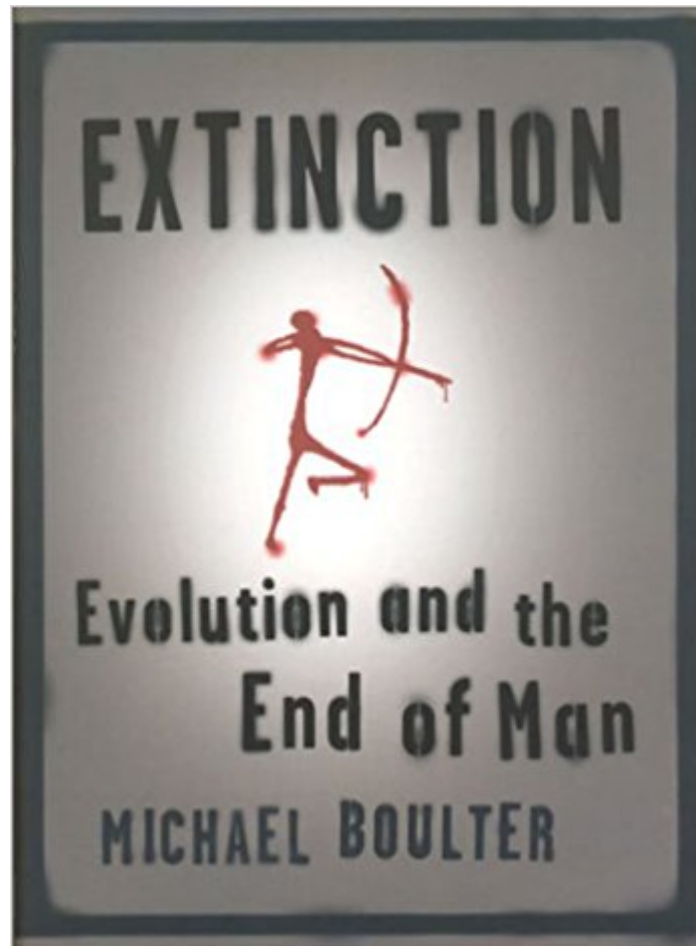




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# Extinction



## Synopsis

Sixty-five million years ago the dinosaurs were destroyed in a mass extinction that remains unexplained. Out of that devastation, new life developed and the world regained its equilibrium. Until now. Employing radically new perspectives on the science of life, scientists are beginning to uncover signs of a similar event on the horizon: the end of man. In telling the story of the last sixty-five million years, Michael Boulter reveals extraordinary new insights that scientists are only now beginning to understand about the fossil record, the rise and fall of species, and the nature of life. According to Boulter, nature is a self-organizing system in which the whole is more important than its parts. The system is self-correcting, and one of its tools is extinction. If the system is disrupted, it will do what it must to restore balance. This book is a thoroughly researched introduction to the new developments in the science of life and a chilling account of the effects that humans have had on the planet. The world will adapt and survive; humanity most probably will not.

## Book Information

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## Customer Reviews

Engagingly argued... Boulter predicts that among mammals it is the ecologically adaptable and undemanding that shall inherit the earth: the rats, the bats, the voles. Personally, I hope that the lemurs make it as well. (Times Literary Supplement) Boulter writes with clarity and verve about findings, theses and models from a wide variety of fields.... Perhaps this book, like a splash of cold water, will help wake us up. (Merle Rubin Los Angeles Times) Boulter has an intriguing tale to tell.... It is indeed a story worth telling, and a book worth reading. (The Independent) It is packed with juicy anecdotes about fossils, evolution, and geological strata... The real attention-getting theme is the

author's proposal that the human species will shortly go extinct...This is a fascinating thesis, not to say one that arouses alarm. (Michael R. Rose *The Historian*) This is an intriguing book that pulls together current understandings of biodiversity, paleobiology, and climatology to present a sobering... And hopeful... Picture of what the future may hold. (Southeastern Review)

The head of the team analyzing Fossil Record 2, the largest database of information on extinct animals and plants, brings us a thoroughly researched introduction to the new developments in the science of life and a chilling account of the effects that humans have had on the planet based on his experience and research.

A little wordy but the subject matter may take that. The author uses a fractal metaphor to see overall patterns in extinctions. If you are not familiar with fractal math read Mandelbrot's book "How long is the coast of England." Excellent read but not for everybody. No asteroids here but good thoughtful analysis.

I rather expected an opinionated editorial type of book. Instead what you get is a lot (perhaps more than you want to) of the science of geology. Put another way, it requires more attention than I expected. I am gratified to have the feeling that I know a lot more of the science behind how evolution works. Too many books of this genre are just opinionated scolding essays on how we're all going to perish. At least after reading this book, I have a better grasp of why--and how.

Very interesting.

While I think that paleobiologist Michael Boulter is certainly correct in his assertion that we are going to go extinct, as all creatures eventually do, I don't think we will go the way of the mammoth or the giant sloth or the Neanderthal. Our exit may very well be totally unique. We may go the way of the dinosaur, of course, our world obliterated by a cosmic catastrophe, or we may blow ourselves up, and then watch the survivors die out in the ruins. But more likely we will pass away quietly as our culture transforms us from what we are now to creatures that are partly the result of genetic engineering and partly the result of mechanical ingenuity, until one day we may notice that we are so different from the humans of the past as to be an entirely different species. But Boulter is not concerned here with cultural evolution. He is looking at the biological evolution of life on earth primarily through the fossil record and in particular through Fossil Record 2, a huge database that

he has studied extensively. His theme, despite the book's title, is the diversity of life, the radiation of living groups, etc., and how an understanding of that diversity through an analysis of the fossil record can shed light on the evolutionary process. He analyzes the growth of life's diversity after the major catastrophic events in the earth's history and plots curves and comes to the conclusion that biodiversity is an example of exponential growth, and that the phenomenon of evolution is another example of a self-organized system (such as sand piles and the weather) driven by "power laws and pink noise." (p. 125) Some of the interesting conclusions that Boulter comes to along the way to forecasting our extinction is that we probably did do in the Neanderthal. (He lists "selfishness" as one of our distinctive traits that the Neanderthal apparently didn't have enough of.) And yes, we wiped out the major fauna of North America within a thousand years or so of our arrival from across the Bering Strait. In fact, we are now living through a period of mass-extinctions, in particular of large mammals, and we are a major factor in those extinctions. My problem with this book is that it is sometimes hard to follow Boulter's argument since he is not as direct as he might be. Then again it may be that I need to read more carefully! At any rate, the fact that biodiversity follows an exponential curve until it hits a catastrophic event is certainly one of his points. And that evolution is an example of a self-organizing system like that of a sand pile, and behaves in similar ways with large changes occurring less often than small changes, etc., is another. Do "groups of animal and plant Families follow clear rules in their origin, expansion, peak diversification and eventual extinction?" is a question he asks. (p. 124) His answer is yes, and the pattern can be traced. He adds that "extinctions are an essential stimulus to the evolutionary process." (p. 183) The "new idea" (as he terms it, p. 182) that mass-extinctions come from "within" as a feature of self-organization does not seem convincing to me, although it is certainly intriguing and worthy of further study. He writes: "So modern man is kicking the sand pile and causing a severe avalanche that only started to crash down at the end of the last ice age...the fundamental cause continues: human aggression. The first phase was our killing other mammal species...then through human history our killing of one another." But is it only a temporary irony that today there are more humans on this planet than ever before? Aggressive we are. And we kill each other with an amazing abandonment, but have such actions led us toward extinction? The evidence is all to the contrary mainly because our reproductive abilities and our ability to exploit planetary resources outweigh our murderous tendencies. And besides the cause of at least some of the great mass extinctions of the past (huge meteorites) clearly came from without. Boulter sees small animals inheriting the earth after we are gone. He notes (p. 193) that "insects and birds are still at the early stage of high diversification." What this means is that a group of animals that is continuing to diversify (continuing to grow in the

number of species) will be safe from extinction until the diversification slows. This is a nice scientific understanding, but what it says to me is that a successful body and behavioral style (e.g., a Family or order or some other classification of organisms) is less likely to go extinct than a less successful one. One might say, QED. He speculates (his terminology, page 176) that "our system is in free fall, out of control." We won't need "nuclear weapons," he posits, "or the inventions of science fiction writers." We are "doing very well...just with our use of fossil fuels." Exactly what he has in mind here is not entirely clear. Does he mean that we will pollute ourselves to death? Elsewhere he writes about global warming, caused in part by our burning of fossil fuels, but advises that fluctuations in temperature are common, and that for much of the history of life on this planet it was hotter than it is now, and that, in fact, for 250 million years from before the P-Tr mass-extinctions until the Miocene there was no frost on earth. (p. 113) Furthermore, "between AD 900 and 1300 cattle were farmed in Greenland and the French tried to embargo English wine." (p. 122) In short, this is not a text for the causal reader. It is dense, and in places, technical. But what Boulter has to say is worth the effort.

Contrarily to the publisher's description, this book is not an alarmist and chilling vision of the end of the human race (also, the p. has it wrong: the extinction event that took place 65 millions years ago is perfectly explained - the meteor; it's the one that dates back to 245 millions years ago whose cause is unclear.) In this book, Boulter touches upon the increasing complexity of the world (a big object hitting the earth started it all, by crooking the planet's axe... and therefore giving us seasons). He also explain the patterns of evolution and extinction one can deduce from the study of fossils (and help our understanding by, among other things, explaining with lifelike descriptions how one would feel in such a warm world with lots of CO<sub>2</sub> as the earth was back then). He then presents the different theories of evolution from Darwin to Gould's Punctuated equilibrium and to the theory he favors : power law in a self-organized system. A self-organized system is like a pile of sand whose shifting grains within the structure causes lots of small avalanche and a few big ones. The earth is a self-organized systems like these piles of sand and throughout history, avalanches (most caused by internal changes and some by external changes) causes species to disappears or adjust. Even in the best of case, a specie cannot lasts forever; its pattern of rapid evolution and diversification and slow extinction follows the spindle curve of a power law, unless there is an external intervention. Humans are just such an external intervention, and not a recent one either. Since the beginning of human history, we could not help but change the dynamics of the worlds around us, from big-games hunts to Industrialization. As a result, the slow extinction curves of many species has taken a faster downward curve... as well as bringing the next ice age much closer. Nothing in "Evolution" goes for

sensationalism or wild theories. Everything is well-documented and lots of graphs illustrates Boulter's explication. Although this is no light reading, it is not a book for expert I think. Also, and I don't know if in feeling this I'm strange or not, this book gave me... well... hope. Because whatever happens, the earth will survive, and something else will happen or evolve on it... and I really wonder what.

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