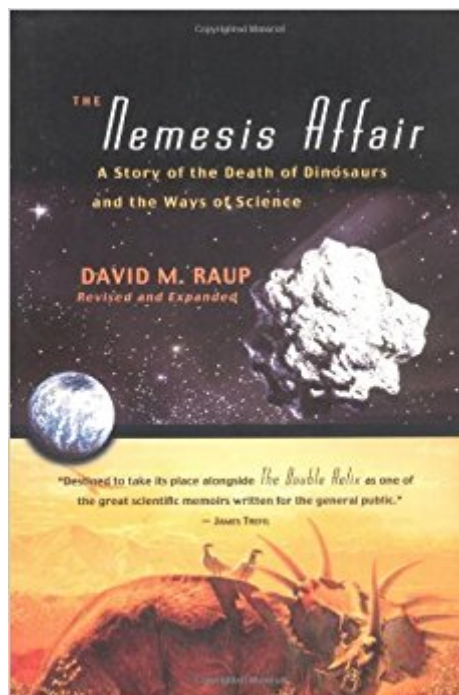




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The Nemesis Affair: A Story Of The Death Of Dinosaurs And The Ways Of Science



Synopsis

"David Raup is, to put it baldly and justly, the world's most brilliant paleontologist."-Stephen Jay Gould
Nemesis is the name given by scientists to a (theoretical) small companion star to our sun. Every 26 million years, Nemesis's orbit brings it close enough to the sun to bombard our solar system with billions of comets. While most of the comets will float harmlessly beyond the outer planets, some passing through the sun's Oort Cloud will be deflected by its gravitational force toward Earth. Such a "large-body impact," the Nemesis theory holds, was responsible for the mass extinction that led to the demise of the dinosaurs. The next impact, millions of years from now, might very well extinguish humanity. In this lively, fascinating, and often disturbing book, updated and revised with the latest scientific evidence on terrestrial impacts, David M. Raup re-explores the controversies of the Nemesis theory from the trenches of the scientific community, and investigates the issues-both scientific and philosophical-of mass extinction. "A fascinating insider's view of scientists at work-and at odds-on the issues of extinction, evolution, and the fate of dinosaurs."-John Noble Wilford

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Customer Reviews

In recounting the "Nemesis Affair," Raup aims to elucidate the scientific and journalistic climate in which the idea was born. The story begins with a 1980 paper in *Science* implicating impact of an extraterrestrial body with Earth as the cause of dinosaur extinction. It proceeds through the later hypothesis that mass extinctions are time-periodic and astrophysicists' suggestions (including

"Nemesis," an undiscovered small companion star to our sun) to explain the periodicity. All the hypotheses are still under debate. Raup, an evolutionary biologist at the University of Chicago and a participant in the "Nemesis Affair," is a clear-eyed and frank, if not completely unbiased, reporter. His book makes good reading for anyone curious about "Nemesis" or about science. Margery C. Coombs, Zoology Dept., Univ. of Massachusetts, Amherst Copyright 1986 Reed Business Information, Inc. --This text refers to an out of print or unavailable edition of this title.

A fascinating insider's view of scientists at work--and at odds--on the issues of extinction, evolution, and the fate of dinosaurs. -- John Noble Wilford Challenging and thought provoking. -- Los Angeles Times David Raup is, to put it baldly and justly, the world's most brilliant paleontologist. -- Stephen Jay Gould Gripping . . . consistently stimulating. -- New York Times

Really interesting in its picture of a scientific dispute in which the evidence is so fragmentary that the truth is unclear.

An insightful read. Raup's explanation for some of the sociological drivers behind scientific progress and the community is really eye opening.

Was assigned for my GEOL 102 was actually a decent read. Had graphs which I liked.

Had to get this for a class but it provides some amazing insight into the field of science, even outside geology. I'm really glad I read it.

In the June, 1980 edition of Science an article written by four UC Berkeley scientists, led by Walter Alvarez, was published. This article claimed an extraterrestrial cause for the extinction of the dinosaurs and other species 65 million years ago. Reaction from paleontologists and others was immediate and largely negative. They saw it as a splashy, media-darling type of catastrophic explanation anathema to most working scientists. Author David Raup and his colleague Jack Sepkoski were however among those paleontologists (Stephen Jay Gould was another) who liked the idea. Since there are a number of other mass extinctions in the fossil record, they wondered if these events might be connected and how. They began a statistical analysis of the record, and in February, 1984 published a paper in the Proceedings of the National Academy of Sciences demonstrating a 26-million-year periodicity. This led to the question, why would these extinctions be

regular and what caused them? The answer came from astrophysicists who postulated (among other theories) a "Death Star" companion to the sun, dubbed Nemesis. This star would periodically come close to the sun, disturbing the Oort Cloud of comets, sending some of them to rain down on Earth, thus killing substantial amounts of life on earth. It's a great theory and I love it. Unfortunately no one has ever seen this Nemesis star, which is not due to return for another 13 million years or so. In fact no one has seen the Oort Cloud either, although I understand most astrophysicists believe it is there. And of course paleontologists do not like catastrophic explanations for mass extinctions. In fact they hate them for both theoretical and personal reasons. Thus we have the ingredients for an engaging and very human story about how science works and how it doesn't work. In this extremely readable book Raup reveals how scientific ideas develop, how they are rejected and accepted, and how some theories can neither be confirmed nor rejected, and how the scientific community treats such ideas, and how the media is involved. The blurb on the book cover has a quote from James Trefil comparing it as a memoir to *The Double Helix*, James Watson's personal story of how he and Francis Crick got credit for discovering the structure of the DNA molecule. I agree that this book is as readable as that very involving story, but Raup's book is more on the order of readable journalism, while Watson's book was more like a novel. What is intriguing in both books is the sheer humanity displayed in both a positive and a negative sense. Here we see a kind of knee jerk, turf-protecting rejection of new ideas by the established cadre of scientists, especially in paleontology. In one sense this is understandable. If you work all your life to help build a certain view of the way things are in your chosen field, and along comes an idea that completely overturns your life's work, you are not going to be happy. You will rail against it and try to show that it is false. We see this in all fields of science since all fields are staffed by humans. I notice in psychology, for example, that the old cognitive and psychoanalytical people find it very difficult to accept the findings of evolutionary psychology, some of which make Freud, for example, look very much mistaken. In this sense scientists are like the Victorians who fought against the ideas of Darwin that threatened to overturn their view of the world (and did!). Part of what makes this book effective is the openness with which Raup tells the story. He is candid to the point of showing and admitting his own faults and prejudices. He shows how success in science is gauged, not by dollars or fame, or even necessarily by what's discovered, but by prestige among colleagues. He writes on page 211 that "one's success as a scientist can be measured more by the number of people he or she puts to work on new problems than by the correctness of specific research results." This book is a revision of the 1986 edition with a new introduction and a new final chapter entitled "Update 1999." The Nemesis Affair is not over with. Raup lets us know that the crater has been found for the

K-T extinction of the dinosaurs, and that most scientists now accept the Alvarez scenario for Cretaceous extinctions. However neither a dark star nor a tenth planet has been found, and so the acceptance of the periodicity of mass extinctions is on hold. To show how ideas in science can lead to totally unexpected advances elsewhere, note that the work done in understanding how the dinosaurs died after the impact of the K-T meteor led to a realization of the possibility of "nuclear winter," which in turn was a factor in ending the cold war. It is somewhat amazing to realize that the work of Alvarez and his colleagues may have helped to prevent a nuclear holocaust. Some people think that money spent on SETI or on space exploration is wasted. I think that knowledge gained is always valuable, and sometimes, spectacularly so.

According to the hypothesis a small companion star to the earth, like a binary, but smaller and more distant (perhaps two light years distant) passes through the Oort belt approximately every 26 thousand years (don't hold your breath), causing some comets to veer from their paths and impact the earth and its neighbors, causing a large scale extinction of species, among whom in the past were the dinosaurs, and giving others, like us and our cousins, a better chance for survival. The author points out that the star, long known as "Nemesis," or the "Dark star", has never been seen--nor, for that matter has the so-called Oort belt. They are both hypothetical, with no evidence of their true existence. The whole idea of why species go extinct, with a life span of from one to ten million years on average, depending on the species involved is a mystery to scientists--much like the mystery of why individuals within a species must necessarily die, perhaps. Although the author defends, as well as finding fault with, scientific method, it sounds much like turf wars between gangs or political parties. And some of their favorite ideas sound, well, less than reasonable shall we say. They seem more impressed with each other's credentials and reputations than the reasonableness of their pet projects. Is a star--even a small one--so hard to see with the optics, radio telescopes, etc., that are available today? Yet, this hypothesis is no more far-fetched than many others, and may well turn out to be true, yet. Mr. David M. Raup is most persuasive in his presentation. There are some good points made herein. For instance the author's point that almost all species that ever existed on the earth have gone extinct--both plant and animal life forms. He also mentions that often they simply change form, from environmental necessity, or gradually spawn new life forms. It would seem inevitable, either gradually or catastrophically for any given species to cease to exist and another to arise. If they died out and were not replaced, soon all life would become extinct, or if they did not necessarily die, then life forms would certainly overwhelm the earth at some point. So, a balance is achieved, which, for whatever reason seems to be the order of things. And the ecologists

who continually fret about how the human race is responsible for all of the earth's problems, and want to "save" all its species except their own--(an impossible task, even if they successfully destroyed all of the "evil" human beings, cockroaches would probably survive) would find that all species would continue to die, and others be reborn. An exercise in futility, gone awry. I suspect that, while the sciences are playing their guessing games and one-upsmanship, the earth will continue to revolve around its poles with a jolly little wobble, continue its orbit around the sun, at least until it implodes, or explodes, and the inhabitants, individually and collectively, will continue to be born, and die, and think that they are so important that they are causing it all. And when Mount Pinatubo or St. Helens erupt they will put out hundreds of times more particulate matter in 24 hours than all of the "pollution" their own insignificant species, Homo Sapiens, will produce in 100 years.(...)

David M. Raup has written an interesting account of the scientific process in *The Nemesis Affair (A Story of the Death of Dinosaurs and the Ways of Science)*. This is a perfect book for the non-specialist as it gives a glimpse into the larger world science inhabits beyond the minutiae of scientific details. This book shows the ways in which the scientific community, the popular press, and the general public all compete and struggle in creating and accepting (or dismissing) new ideas. The belief that dinosaurs died out partially due to a meteor or comet colliding with earth is one such idea and its genesis from a small spark of inspiration into common belief is told in a clear and entertaining fashion. This is a book that is interesting for the scientific idea it is trying to postulate as well as for the way it illuminates the larger world science is trying to inform and shape.

The book, though now outdated, presents a wonderful insight into science and how it works. Especially well written, the author clearly explains the interlocking processes and activities that makes science what it is. He also reveals some of the deep biases that often exist among scientists committed to a paradigm. A recommended read for anyone interested in dinosaurs and their demise.

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