

Star on the make?

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The Nemesis Affair: A Story of the Death of Dinosaurs and the Ways of Science.
By David M. Raup. Norton: 1986. Pp. 220. \$15.95, £12.

"I HAVE never seen Francis Crick in a modest mood" is one way to start a book; "This is the story of an emerging scientific theory about the extinction of dinosaurs and other prehistoric life forms" is another. With the first sentence of *The Double Helix* we know just where we are — the academician is out of school, the bag is open and the cat is flying, together with whatever else was in there. The opening of *The Nemesis Affair* does not set the scene so plainly. Is the academician in or out of school, and if in, what class are we with?

Of course it is unfair to compare David Raup's book with Watson's, but Raup is used to the ways of science and knows they are not paved with fairness. It is not often that a leading professional tells the tale while still close to the events — Raup calls it "a view from the trenches" — and the Watson/Raup comparison does bring out aspects of the ways of science. For one thing, the pace is killing today: there was a gap of 15 years between the events Watson wrote of and his book, whereas Raup hits the streets only two years after the birth of Nemesis, the name given in *Nature* of 19 April 1984 to a possible companion star to the Sun, producing periodic comet showers and mass extinctions.

Nemesis was born as one of several possible causes for a possible series of events. In February 1984 (*Proceedings of the National Academy of Sciences*, 81, 801–805), Raup and Jack Sepkoski published a statistical analysis of Sepkoski's data on the first and last appearance of each marine family in the fossil record. They concluded that extinction is non-random, with a 26 Myr periodicity; one of their eight best-fitting mass extinctions is at the Cretaceous/Tertiary boundary, hot property since 1980 because of the iridium spike which may imply extraterrestrial impact. Six weeks after the Raup and Sepkoski paper in *PNAS* came the 19th April *Nature* containing an editorial by John Maddox, a "News and Views" piece by Tony Hallam, and a block of five papers, all bearing on extraterrestrial causes of periodic mass extinction. (Turning back to *Nature* in 1953, the Watson and Crick paper didn't merit mention in "News and Views", which then read rather like the Court Circular.) Maddox's editorial commented (Raup calls it "mild wrist slapping") on the practice of distributing preprints, which in this case resulted in the

possibility of the *Nature* papers appearing before the Raup and Sepkoski data they purported to explain. John Maddox saw this as "a kind of nonsense", but at least it is nonsense with a limit. The pace can get no hotter once the hound and hare coincide.

Since 1984, it is hard to pick up a journal in the fields of geology and evolutionary biology which doesn't contain a paper, review or meeting report touching on mass extinctions. DNA was slower to get up steam, but once it got going it was unstoppable, and we all know what has been achieved. Can we expect a similar profoundly important research programme from Nemesis *et al*? I think not, and Raup gives no real sign that he thinks otherwise. He ends his book with some comments on the pecking order from "hard" to "soft" science, placing molecular biology at the hard end and palaeontology (his own field) at the soft. We can see now that Watson and Crick's achievement was to begin to move parts of biology from the historical (soft) towards the physical (hard) end of the spectrum — to put some determinism among the contingency. Periodicity in mass extinctions, and extraterrestrial explanations for it, might seem to promise the same for parts of palaeontology. But, so far, the controversies over periodicity and the less general question of extraterrestrial impact as the cause behind particular extinctions exemplify the field of sociology (which Raup puts right at the bottom of the pecking order) as much as hard science. Recalling Raup's "view from the trenches", those involved seem first instinctively to have either volunteered for the neo-catastrophist revolutionary force or

rallied to the flag of Lyellian uniformitarianism, and then started looking around for ammunition. (The latest skirmish in *Nature* was "Matters Arising" in May this year (321, 533–536).)

Raup has some level-headed comment on the prevalence of prejudice and preconception in his chapter on "Belief Systems in Science", but ultimately the Raup and Sepkoski periodicity thesis (and so the possibility of Nemesis) rests on the quality of Sepkoski's taxonomic data. That is where I believe the thesis is weakest, but the attack will necessarily be slow and piecemeal. *The Double Helix* was a success story, whereas Raup's book may turn out to be (as he acknowledges) just the happier half of a chronicle of failure. If so, he may find a benefit in avoiding "saganization", the word he coins for the (unmerited) fall in professional esteem that accompanies the rise in visibility of any scientist taken up by the media.

Like *The Double Helix*, Raup's book can be read at a sitting. What gripped the reader in Watson's story was the personalities, the emotions, the indiscretions. Perhaps because he is still so close to the events and to the people, Raup has left all that out; his colleagues or opponents are characterised as no more than "brilliant", "prominent" or "hardworking". No one will take offence at the book, but the lack of emotion or indiscretion means that the narrative and the writing have to do a lot of work. On the whole, they stand up to the strain; the pace of the narrative picks up in the second half of the book once the scene has been set, and the writing is good popularization, though occasionally slipping a bit too far down market. The first words of "what is known as the Upper Eocene" or what are called the Middle and Upper Jurassic are no sop to anyone, and the sentence that Raup and I (unfairly) begin with does not set the true tone of the book. □

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