

Meteor strike may not have killed dinos/demise began earlier

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Meteor strike may not have killed dinos

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By KENT ATKINSON

<http://www.stuff.co.nz>

A New Zealand evolutionary biologist and a British colleague say that birds and mammals may have displaced dinosaurs gradually in the 20 million years before the disastrous asteroid impact traditionally blamed for the dinosaurs' extinction.

Professor David Penny, from Massey University, and Matt Phillips from Oxford University, say that fossil and molecular evidence does not support the theory of an asteroid-impact extinction, and that it is in need of urgent re-examination.

Popular theory says that birds and mammals were only able to flourish on Earth once an asteroid impact wiped out the dominant dinosaurs and pterosaurs at the end of the Cretaceous period 65 million years ago. But Professor Penny and Dr Phillips are not convinced.

"We agree completely with the geophysicists that an extraterrestrial impact marks the end of the Cretaceous," Professor Penny said. "But after 25 years they have still not provided a single piece of evidence that this was the primary reason for the decline of the dinosaurs and pterosaurs."

Writing in the October issue of *Trends in Ecology and Evolution*, published today, the two scientists have said that instead of accepting the geophysicists' theory at face value, they want scientists to take a closer look at the fossil and genetic evidence.

"Although the asteroid at the end of the period was real, we think it's natural evolutionary processes that made the difference," Professor Penny said in a statement today.

They believed that mammals and birds over 20 to 30 million years started

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to out-compete dinosaurs, as they began diversifying between 80 to 90 million years ago.

Professor Penny is now researching how the first complex living cell with a distinct nucleus evolved about 1.5 billion years ago, producing the last universal common ancestor of all plants, animals, amoebas and fungi.

Even further back, he is researching the origin of life itself, perhaps 3.5 billion years ago: evidence so far suggested that life began in cool seas, at a time when the atmosphere outside was inhospitable to any living thing, rather than around hot hydrothermal underwater vents on the seafloor.

Professor Penny said fossils could tell scientists when the different species of dinosaurs, birds and mammals roamed the Earth, which would indicate when the dinosaurs started their demise, and when birds and mammals began to proliferate and diversify. But the fossil record was patchy, so many conclusions would be tentative.

Increasingly sophisticated technology and techniques in molecular biology which had enabled advances such as the sequencing of the human genome, was a powerful new tool in the scientists' arsenal.

By looking at the molecules from living animals scientist could, in principle, reconstruct the family trees of all living animals and those family trees could help show whether the ancestors of the living birds and mammals arose very quickly after the asteroid hit the Earth – thus supporting the popular theory – or whether their appearance was far more gradual.

"So far, this evidence contradicts the popular theory," Professor Penny said. "The combined evidence from fossils and molecules appears to support an expansion of birds and mammals, and a decline of pterosaurs and dinosaurs, starting many millions of years before the end of the Cretaceous"

The impact, its effects and disruption to ecosystems, probably finished off the dinosaurs that were not bird-like.

But two biologists said that a dogmatic adherence to the popular theory had steered scientists from examining the real reasons behind the mass extinction.

"I see the discovery of the asteroid impact that marked the end of the Cretaceous as simultaneously a high point, and low point of 20th century science," said Professor Penny.

"It was a high point from the view of a brilliant new explanation of the iridium layer that correlated geological strata world-wide: outstanding.

"But it was also a low point, equivalent to the report of supposed N-rays, cold fusion, and inheritance of acquired characters on the pads

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of the midwife toad".

The killer comet was first aired by United States geologist Walter Alvarez in 1980. He argued that large amounts of the metallic element iridium found in sediments deposited at the end of the Cretaceous period indicated that a huge meteorite had struck Earth with such force it raised a suffocating dust cloud which spread iridium around the globe and shut out the sun for years.

In New Zealand, coal seams in a stream bank adjacent to the Moody Creek coal mine, north of Greymouth have an iridium concentration of 71 parts per billion, the highest known for non-marine rocks anywhere in the world.

But the asteroid impact theory has long been controversial. A French professor of palaeontology at the French Natural History Museum, Leonard Ginsburg, began publishing more than 30 years ago an argument, that a gradual drop in world sea levels led to disastrous climate changes for dinosaurs.

Prof Ginsburg has strongly criticised the American theory that the dinosaurs were wiped out after a giant meteorite smashed into the Earth with a force estimated at five billion times that of the Hiroshima nuclear bomb.

"It is obvious the dinosaurs died over the space of millions of years and not in one cataclysmic event," he told the Reuters newsagency. "The trouble is Americans like wonderful disaster scenarios and my idea is not spectacular enough."

Solid evidence that at least some dinosaurs slowly dwindled into oblivion rather than blasted off the face of the Earth by a meteorite has been found in the United States itself, in fossil sites in the state of Montana.

Digs have shown that 75 million years ago there were 30 species of giant reptile living in the area. Five million years later there were 23, within two million years the number had fallen to 18, and so on down until the end of the so-called Cretaceous period when all the dinosaurs had died out.

Earth's history has been marked by a succession of mysterious periods of mass-extinction when whole families of animals disappeared for good, such as at the end of the periods known as the Permian (245 million years ago), Devonian (360 million years ago), Ordovician (438 million years ago) and the Cambrian (510 million years ago).

Prof Ginsburg has argued that a common element probably tied all of these events together – sea movement caused either by changes to the polar icecaps or shifts of the Earth's crust.

"Tiny green men might have been a better experiment."

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Stephen Hawking

(paraphrasing from a "Universe in a Nutshell".