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2. Show evidence of a close reading.
3. 1+ page reflection in your WN

Scientists Settle on Single-Asteroid Hit as Culprit in Dinosaurs' Demise

A 'dream team' of researchers concludes that the massive Gulf of Mexico impact 65.5 million years ago -- not volcanoes or multiple impacts -- indeed caused the greatest extinction event of all

Source: By Thomas H. Maugh II/*Los Angeles Times*/March 4, 2010

It's official: The extinction of the dinosaurs and a host of other species 65.5 million years ago was caused by a massive asteroid that crashed into the Gulf of Mexico, creating worldwide havoc, an international team of researchers said Thursday.

The 7.5-mile-wide asteroid was traveling at a speed about 10 times that of a rifle bullet when it hit, releasing a billion times more energy than the Hiroshima atom bomb. The impact blew dirt and rock around the world, set massive wildfires, knocked down forests worldwide, triggered massive tsunamis and earthquakes of magnitude 11 or larger and even caused parts of the continent to slip into the ocean.

Those events wiped out more than half of all species on Earth in what has been called the greatest extinction event of all time. The species lost included not only the dinosaurs, but also the bird-like pterosaurs, large marine reptiles and many smaller land and sea creatures, clearing the way for the emergence of mammals as the dominant life form on the planet.

All of this may sound familiar. In fact, the idea was proposed 30 years ago by Nobel laureate physicist Luis Alvarez and his son Walter after they found abnormally high concentrations of the element iridium in sediments from what was then known as the K-T boundary. This 65.5-million-year old layer of Earth separates fossils of the Cretaceous period from those of the Tertiary period.

Iridium is rare on Earth, but common in space, and the Alvarazes proposed that a giant asteroid had hit the Earth, producing the sudden decline in species diversity previously observed at the K-T boundary -- which is how the boundary got its name in the first place.

Then, in 1991, researchers discovered a 120-mile wide, 1.5-mile deep crater called Chicxulub in Mexico with the same age as the K-T boundary. Most considered it the smoking gun for the extinction.

In recent years, however, some scientists have speculated about alternative causes for the extinction, arguing that it could have resulted from multiple asteroid impacts or, more likely, massive volcanic eruptions at the Deccan Traps in India.

To settle the question, European researchers decided to assemble what Kirk R. Johnson of the Denver Museum of Nature and Science called "a K-T boundary dream team," a collection of 45 internationally renowned scientists in a broad spectrum of disciplines to analyze the possible causes of the extinctions. Funding came from the

National Science Foundation in the United States and from similar groups in other countries. Their conclusions will be published Friday in the journal *Science*.

"The answer is quite simple," Johnson, a co-author and spokesman for the group, said in a telephone news conference. "The crater really is the culprit."

The aftereffects from the impact "shrouded the planet in darkness and caused a global winter, killing off many species that couldn't adapt to the hellish environment," co-author and Earth scientist Joanna Morgan of Imperial College London said in a statement.

Proponents of a multiple-impact theory have cited the fact that there appear to be several distinct layers of comet debris near the Chicxulub crater and evidence for many species surviving after the impact, only to go extinct later. But the research team concluded that those anomalies were created by jumbling of strata when debris flowed back into the crater after the impact.

There are now more than 350 sites around the globe where researchers have studied the K-T boundary -- now officially called the Cretaceous-Paleogene, or K-Pg, boundary. (K is the traditional abbreviation for the Cretaceous.) The sites that are distant from Chicxulub show evidence of only one impact.

Timing is the problem with the Deccan traps. A variety of data show that there were three major pulses of volcanic activity, one about 400,000 years before the K-Pg boundary, one about 200,000 years after and one sometime in the middle.

If the volcanism were the cause of the extinction, "we would expect to see events in the biological world associated with it, but we don't," Johnson said. In fact, the first pulse of volcanism was associated with a slight global warming and an increase in biological diversity.

Moreover, the amount of sulfur injected into the atmosphere by the volcanoes -- assumed to be the cause of their global effects -- was actually many factors of 10 smaller than that ejected in the impact.

And what does it matter? "There are a lot of asteroids out there now," Johnson said, and it is important to know what would happen if one were to strike the Earth.

Possible WN topics:

Write a reaction to the last paragraph

Do you think the theory makes sense? Why? Why not?

Will humans ever face extinction? Why? Why not?