

What Happened to the Dinosaurs?

A great extinction event occurred 65 million years ago, and creatures like these disappeared.



Great Extinction Event @ 65 MA

- On land, the big dinosaurs disappeared, along with some small ones
- Many other land organisms went extinct, including pterosaurs, some mammals
- 50 to 80% of land plants disappeared
- In the oceans, many marine microscopic single-celled organisms (plankton) disappeared
- Many larger marine animals disappeared (rudistid clams, ammonites, many vertebrates, including plesiosaurs, ichthyosaurs, mosasaurs)

Walt Disney's view....



National Enquirer's view.....



The Weekly World News View....



What do Scientists think happened to the dinosaurs?

- What is science, what do scientists do?
- How is science different from art and religion, and how is it similar?
- In scientific terms, how does the theory of evolution differ from biblical creationism and "intelligent design?"
- What is the scientific evidence, and how is it interpreted scientifically?

What Happened to the Dinosaurs?

- We will synthesize evidence from:
 - Geology
 - Astronomy
 - The Fossil Record
 - Biology of Modern Organisms
- You will be the jury:
 - You will weigh the evidence
 - You will be asked to defend your decision

This explanation might be true, but there is no evidence, nothing to test, nothing for scientists to work on. And it doesn't explain the extinction of other creatures.



But there is evidence that an episode of unprecedented volcanic activity may have played a role. Massive volcanic activity is one scientific hypothesis that we will examine.



The Volcanic hypothesis asserts that:

- mass extinction occurred gradually, acting over thousands to millions of years
- atmosphere was gradually polluted by high level of dust, ash, and toxic gasses
- lava flows piled up over large regions of the globe
- acid rain degraded terrestrial and marine environments
- deteriorating environmental conditions caused decline in population levels of many species
- winter temperatures gradually cooled; summers become hotter
- one by one, species died off until perhaps as many as half the world's species were gone

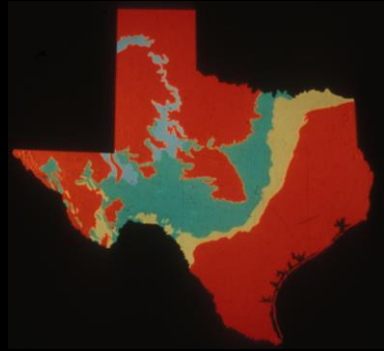
Other scientists argue that a giant asteroid struck the Earth 65 million years ago, and that this is what killed the dinosaurs.



The Asteroid Hypothesis asserts that:

- mass extinction occurred instantaneously - in a few days or a few years - one generation
- an asteroid of enormous proportions struck the Earth at between 50,000 to 150,000 miles per hour
- the impact blast was more than 1 million times greater than the strongest earthquake ever recorded
- about 5000 cubic miles of debris was ejected from the crater, throwing a great dust cloud into the atmosphere
- huge tidal waves scoured across the continental margins
- wildfires incinerated the more inland regions
- atmosphere became so choked with debris and smoke that no sunlight penetrated to the ground
- plants died, herbivores starved, and so did the carnivores

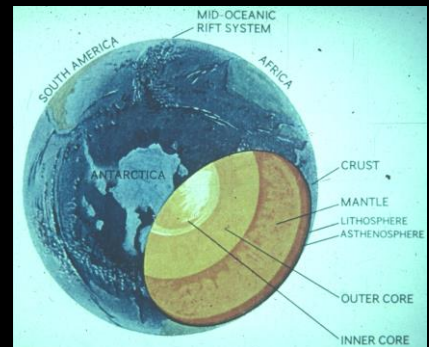
Evidence from Texas.....



Evidence from the stratigraphic record....



Evidence from inside the Earth....



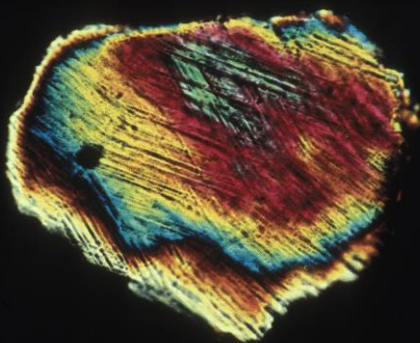
...and the Earth from space



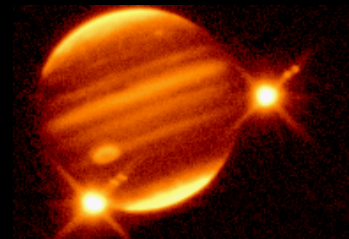
Evidence from the tectonic history of the Earth...



microscopic geological evidence



Evidence from outer space...



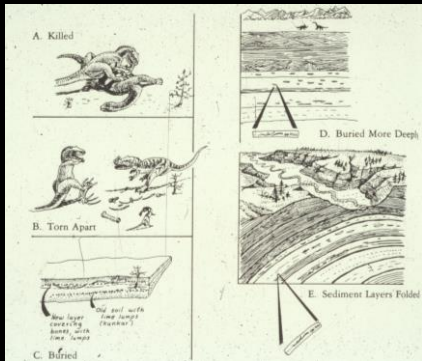
large-scale geological features



Evidence from the life and death of modern creatures....



Evidence from the Fossil Record...



Great museums and fossil collections



New fossil discoveries from around the world



Evidence from the structure, behavior, and geography of living species.....



The skeleton will be especially important.



Including the Great Ice Age Extinction...



We will also examine other recent extinction events.



Is either or some combination of both of these hypotheses true? There are three important criteria in testing the hypotheses:

- 1) Is there any geological evidence for the proposed mechanism?
- 2) How did the effects of that particular mechanism affect the organisms that died, and why did the survivors survive?
- 3) How well does the time-line for the proposed mechanism match the evidence in the rock and fossil record?

Lastly, we will ask, "Did the dinosaurs really become extinct?"



Course Requirements and Resources

www.geo.utexas.edu/courses/302d/default.htm