

# Dinosaur Extinction

Millions of years ago, great beasts called “dinosaurs” thundered over the earth. Yet up until the last century, when the first dinosaur fossils were discovered, no one even imagined such animals existed. Over the past 150 years, modern dinosaur hunters -the paleontologists- have searched for and discovered new remains.

There have been many mass extinctions throughout the history of the Earth. Probably the most famous is the extinction that finally saw the end of the dinosaurs reign on the Earth, 65 million years ago. Whatever caused the death of the dinosaurs also caused the death of around 70% of all of the species on the Earth. There are many theories about why the dinosaurs finally became extinct, some of which are more than a little outlandish.

The two main 'serious' theories are the asteroid and volcano theories, both of which make some use of the analysis of the rocks in and around the K-T boundary (meaning the boundary between the Cretaceous period and the Tertiary period).

In the late 1970's Luis and Walter Alvarez along with a team of scientists from the University of California were making a study of the rocks around the K-T boundary. Researches revealed that the levels of iridium contained in the clay were roughly 30 times the normal levels. Iridium is an extremely rare element, so it's discovery in 'large' amounts indicates that something serious happened. There are 2 sources of iridium, the main source comes from outer space in the form of cosmic dust. A second source is the Earth's core when there are eruptions of volcano. From this information it can be seen that there are only two possible theories to explain the increased presence of iridium either an asteroid strike or a massive volcanic eruption.

Of the two more serious theories perhaps the most well supported theory is concerned with the impact of a large asteroid type body.

It has been calculated that a chondritic asteroid approximately 10km in diameter would contain enough iridium to account for the iridium contained in the clay layer. Analysis has also revealed the presence of soot within the layer which is thought that comes from the very large global fires. Something else that was found within the clay were quartz crystals that had been physically altered. This alteration only occurs under conditions of extreme temperature and pressure.

Despite all of this evidence many geologists did not believe in this theory and many were saying 'show us the crater'.

In 1990 a scientist called Alan Hildebrand 'found' a ring structure 180km in diameter which was called Chicxulub on the Yucatan Peninsula of Mexico. The crater has been dated as being 65 million years old. The size of the crater is suitable.

So we now have some of the proof of the asteroid theory. The big question is what were the results, and how did they effect the dinosaurs.

At the velocity of a impacted 10km diameter object there would have been an initial blast which would have destroyed everything within a radius of between 400 and 500km, including the object. At the same time large fires would have been started. Huge clouds of dust would have been thrown into the atmosphere. Giant waves called tsunamis would have been started causing even more damage. The blast would also start a chain reaction of earthquakes and volcanic activity. There would have also been caused very high winds. The cloud of debris would have caused months of darkness and a decrease in global temperatures. After this there would have been an increase in temperatures caused by the large amounts of CO<sub>2</sub> released by global fires. Eventually this would cause chemical reactions that would result in the formation of acid rains.

The effects of the impact on the flora and fauna would have been devastating, especially on the large animals which would need large food supplies and on the dinosaurs which would need sun light to keep warm.

In the sea the effects would have been just as dramatic. There would be a massive disturbance of the marine food chain through the death of much of the plankton.

After a short period of time some of the plants that had been burnt down would have regrown. As is common with all mass extinctions there would have a sudden evolutionary burst as new species developed.

Altogether, with reference to this idea, the dinosaurs died quickly by fire, storm, poison and starvation.

There is much more work to be done on mentioned theories ...understanding the K-T extinction would help us to understand mass extinctions in general, and might provide a glimpse into the fleeting, evanescent nature of our own mortality. So....could such an impact ever happen again and destroy our civilization? Could we be found as fossils someday, and would no one know why we died?