

How the Dinosaurs Died

What Were Dinosaurs?



The first dinosaurs appeared in the fossil record in the Triassic Period.

Dinosaurs were reptiles that emerged during the Triassic Period, which lasted from 252.17 to 201.3 million years ago. However, at the end of the Cretaceous Period, around 65 million years ago, most dinosaurs had died out.

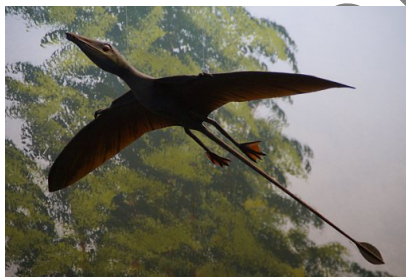
Despite their seemingly complete disappearance, their descendants live among us today. Birds evolved from a specific clade of dinosaurs, the **maniraptorans**, that lived during the Mesozoic Era, which included the Triassic, Jurassic, and Cretaceous Periods. Perhaps the most famous maniraptoran is the *Velociraptor*, although it looked quite different in real life than it does in the *Jurassic Park* movies: it was small, perhaps the size of a turkey, and covered in feathers.

So, how did most dinosaurs go extinct? There are two theories, and they're not necessarily mutually exclusive. Here, we will address both theories and some of the controversy surrounding the dinosaur extinction.



Birds are descendants of dinosaurs.

How Dinosaurs Went Extinct



Pterosaurs were one of the dinosaur groups that disappeared at the end of the Cretaceous Period.

The end of the Cretaceous Period was marked by an extreme extinction event, called the Cretaceous-Tertiary, or Cretaceous-Paleogene Extinction, abbreviated K-T. Over half of the world's species died out. This included the **non-avian** (non-bird-like) dinosaurs, including the marine dinosaurs and the **pterosaurs**

(flying dinosaurs, such as the pterodactyl). In the marine realm, many species of sharks, sponges, brachiopods (non-molluscan shelled invertebrates), and plankton disappeared. So too did the last of the **ammonites**, squid-like invertebrates with coiled shells that emerged during the Triassic Period, around 240 million years



Ammonites went extinct during the same event that wiped out most of the dinosaurs.

ago. Many plant species were similarly wiped out. Some reptiles (including crocodiles and turtles), amphibians, mammals (perhaps only 7%), birds, and invertebrates (such as snails, sea stars, bivalves, and sea urchins), however, managed to survive.

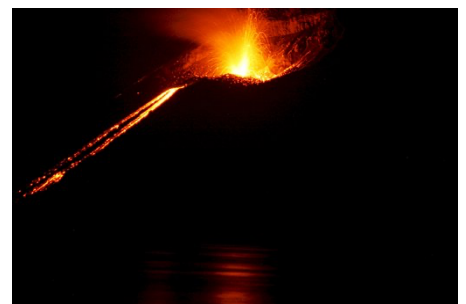
But why did so many organisms disappear? Scientists have a couple of ideas.

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Scientists have quite a bit of evidence to support the theory that an asteroid impact killed the dinosaurs. One major piece of evidence is that a high concentration of **iridium**, which is a rare metal on earth, is present in the geological boundary between the Cretaceous and Tertiary Period. The concentration is around 30 times greater than the average iridium concentration on Earth. This boundary layer exists in the ocean floor and on land. Proponents of the asteroid theory hypothesize that it could only have come from an extraterrestrial source, such as an asteroid or comet. Iridium is found in meteorites in the same concentration as is measured in the geological boundary. Also included in and around the boundary layer are pieces of melted rock considered to be evidence of a massive explosion around the time of the K-T extinction and crystals fractured in a pattern scientists think could only result from an impact. Furthermore, an enormous crater off the Yucatán Peninsula of Mexico (110 miles (180 kilometers) wide) was found to have formed 65 million years ago, corresponding to the



A second K-T extinction theory suggests that it was caused by volcanism rather than an asteroid impact.

time most dinosaurs went extinct.

A second theory holds that volcanic eruptions in modern-day India expelled gases, such as carbon dioxide and sulfur, as well as dust and ash into the atmosphere, leading to shading, global warming, and increased ocean acidity. The increased gases in the atmosphere and the oceans poisoned sea life and many land animals, and may have also resulted in the extinction of most dinosaurs.

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Controversy

Although the two theories examined are the two most commonly accepted, scientists still question them. Fossil records show that there was a gradual decline of dinosaurs in some areas of the world, but in others the decline seems to have been rapid. Some scientists argue that the asteroid would have been too small to cause extinction on such a grand scale. Possibly both theories are correct, which would partly explain the differences in fossil records in different areas of the world. Perhaps the asteroid impact set off some of the volcanic activity that occurred in other parts of the world. However, could there be more at play here? Some scientists believe that gradual climate change and fluctuating sea levels are to blame for the mass extinction event, instead of asteroids and volcanic activity.



Chickens are descendants of dinosaurs.

Conclusion

Next time you see some birds flying outside your window or chickens pecking at food on the ground, think about where they came from and what their ancestors survived. These are the descendants of dinosaurs. Their line stretches back millions of years. Although their ancestors are now extinct, birds are a living reminder of the amazing, sometimes frightening animals that once roamed the Earth. From the massive *Tyrannosaurus rex* to the feathered *Velociraptor*, today's birds had a formidable beginning. Here, we have examined two different theories of how the dinosaurs became extinct and the controversy surrounding those theories. What do you think happened?

Reading Comprehension Questions

1. When
2. What type of dinosaurs did birds evolve from? Which famous dinosaur species is part of that group?
3. What
4. What are the two major theories to explain the dinosaur extinction?
5. What
6. What
7. The presence of what type of metal in the Cretaceous/Tertiary boundary may be evidence of an asteroid strike or volcanic activity? Why?
8. What

Extension Questions

9. Which hypothesis do you believe is correct? Do you think both could be right? Neither? Explain your answer.
10. How

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