“Crash Test: What Wiped Out the Dinosaurs? Scientists Studying an Enormous Crater in Mexico Hope to Find the Answer”


APA: ()

1. A giant space rock races across the sky and smashes into the Gulf of Mexico. The impact blasts a hole in the ground deeper than the Grand Canyon. It also ejects billions of tons of rock into the atmosphere. The debris coats the entire globe with a thin layer of extraterrestrial dust, or dust from beyond Earth’s atmosphere.

2. Most scientists agree that a giant space rock—an asteroid or a comet—slammed into Earth 65 million years ago. It happened at the K-T boundary, the dividing time between the earlier Cretaceous Period and the later Tertiary Period of Earth’s history.

3. What scientists cannot agree on is the effect the impact had on life on Earth. The K-T boundary also marks one of the biggest “die-offs” in Earth’s history, one that erased 70 to 75 percent of the planet’s species, including the dinosaurs. Did the collision cause the mass extinction? A team of scientists from Mexico, the United States, and Europe is now trying to find out by examining rock taken from the site where the collision occurred long ago.

A Boring Project

4. The rock was extracted earlier this year from the north coast of Mexico’s Yucatan Peninsula, near the fishing village of Puerto Chicxulub (CHICK-shoo-loob). Far underground lies the giant crater that was carved out of the crust by the impact. The crater is buried under about 1 kilometer (0.6 miles) of sedimentary rock, or rock created by minerals and organic matter settling over many years.

5. Each day drills bored deeper into the ground, pulling out samples of rock. The final target was the rock just below the crater. This is the type of rock that was hit by the asteroid. Scientists estimate that 200,000 cubic kilometers of ground were instantly vaporized, melted, or ejected when the asteroid struck. That’s a lot of fallout! Examining the rock at that level will help scientists determine just how harmful the fallout was to life on Earth.

Toxic Rock?

6. What kind of rock was involved? One possibility is limestone. Limestone forms when the shells of marine creatures sink to the seafloor and harden into rock.

7. If the asteroid hit limestone, the heat from the impact would have turned it into carbon dioxide (CO$_2$) gas. Carbon dioxide is a greenhouse gas, one that keeps the surface of Earth warm. A large amount of CO$_2$ thrown into the atmosphere by the
impact would have drastically raised Earth’s temperature, causing the extinction of various wildlife.

8. That’s bad. But the rock might be anhydrite instead, a much worse possibility. Anhydrite is a mineral rich in sulfur that forms when the sun evaporates pools of brine (seawater).

9. Heat from the asteroid impact would have changed anhydrite rock into sulfur dioxide ($SO_2$) gas. The $SO_2$ would have mixed with water vapor in the air to form clouds of sulfuric acid ($H_2SO_4$). Those clouds would have lingered in the atmosphere for years, blocking out the sun.

10. The combination of the sulfuric clouds and the rock dust thrown up by the asteroid’s impact would have plunged Earth into a dark, deep freeze. Most plant life would have died, starving many other life-forms. Making matters worse, eventually the sulfuric acid in the sky would have fallen as acid rain, poisoning the water and the soil and destroying even more plants and animals.

**Blast From the Past**

11. The drilling project also brought up other types of rock, including melt rock and breccia, which will help scientists determine how strong the impact was. Melt rock is glassy material formed by the fusion of rocks under an impact’s terrible pressure and temperature. Breccia is the rubble left by rocks that were blasted into the air on impact.

12. By measuring the size, structure, and amount of melt rock and breccia left over from the impact, the scientists hope to calculate how much debris was vaporized. The stronger the impact, the greater the amount of debris and the greater the amount of climate-altering gases released into the air.

**Triple Whammy**

13. Scientists who think the world’s dinosaurs went out with a bang are called catastrophists. They believe that the asteroid impact was extremely explosive, producing enough deadly sulfuric clouds to kill most life on Earth.

14. Scientists who believe otherwise are called gradualists. From their work with fossils, the gradualists have concluded that the world was already in deep trouble by the end of the Cretaceous Period. Sea levels were dropping. Plant and animal diversity was steadily declining. And a rash of volcanic eruptions was flooding the planet with lava. The lava, in turn, was pumping huge quantities of ash, $CO_2$, and $SO_2$ into the atmosphere. The asteroid was, perhaps, simply the final blow in a life-or-death struggle the dinosaurs and many other life-forms were already losing.

15. Catastrophists or gradualists—whose story is right? The rocks might soon tell.