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Letters

Impact scenarios

I have followed with interest the discussion of the two theories for the mass extinction 65 million years ago ("Closing in on the Killer," SN: 1/25/92, p.56). The impact at Yucatán apparently occurred at about the same time as the massive volcanic eruptions in the Deccan Traps. An interesting coincidence is the fact that at the time of the impact, the Deccan Traps were located almost exactly at the antipode of the Yucatán, if continental drift is considered. At that time the Deccan Traps were located northeast of the current site of Madagascar.

There is a biological counterpart to the possible Yucatán/Deccan Traps linkage. Blunt trauma to the skull is not uncommonly complicated by the so-called contrecoup injury. For instance, with blunt trauma to the back of the head, diffuse and more widespread injury may occur at the "antipode" in the frontal and temporal lobes. This may be due to focusing of the shock wave on the anterior parts of the brain by the geometry of the skull cavity. Similarly, in the case of the Yucatán impact, the

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Cover: On tiny Christmas Island in the Pacific, atmospheric scientist Ben Balsley and his teammates prepare to test a specially designed high-altitude kite. Larger versions of this prototype could play an important role in future meteorological research. (Photo: G. William Tyrrell Jr.)

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shock wave would be expected to focus in the Deccan Traps area, causing more diffuse and widespread fracturing of the crust. This would fit the description of the Deccan Traps as a widespread source of lava flows.

Curt A. Wiederhielm
Moclips, Wash.

Some researchers have investigated the idea that impact-generated seismic waves focused on a point directly across the globe, thereby sparking massive eruptions at the antipodal site. But it appears that the Deccan Traps were not antipodal to the Chicxulub structure in the Yucatán during the Cretaceous period, according to J.T. Hagstrum and B.D. Turrin of the U.S. Geological Survey in Menlo Park, Calif., who presented their findings last December at a meeting of the American Geophysical Union. The point opposite the Deccan Traps would have been somewhere in a part of the Pacific Ocean that has since subducted beneath North America, the researchers say. If a bolide did indeed strike this portion of the ocean floor, the subduction process would have long ago carried the crater deep into the Earth.

— R. Monastersky

I have one question about the K-T impact scenario. You mention the tektites caused by rock being melted by the impact and the glass in the Mimbral sediments caused by impact-molten rock cooling. Now, the bolide had to have been big, and there is no particular reason to think it was perfectly smooth and spherical. So it should have produced lots of friction as it entered the atmosphere. It should itself have been very hot. In addition to displacing a lot of water when it hit, did it also produce a lot of steam, and if it did, how would that have added to the calamity?

Georgianna Henry
University, Miss.

Geochemist Cesare Emiliani of the University of Miami examined that question a decade ago. He says the water ejected into the atmosphere would have condensed on dust particles, forming raindrops that fell to the ground. Therefore, the dust cloud from an oceanic impact would have lasted much less time than one from a land impact. The water vapor also warmed Earth's climate by enhancing the greenhouse effect, he suggests.

— R. Monastersky

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