RECORDS OF THE APOCALYPSE: ODP DRILLS THE K/T BOUNDARY

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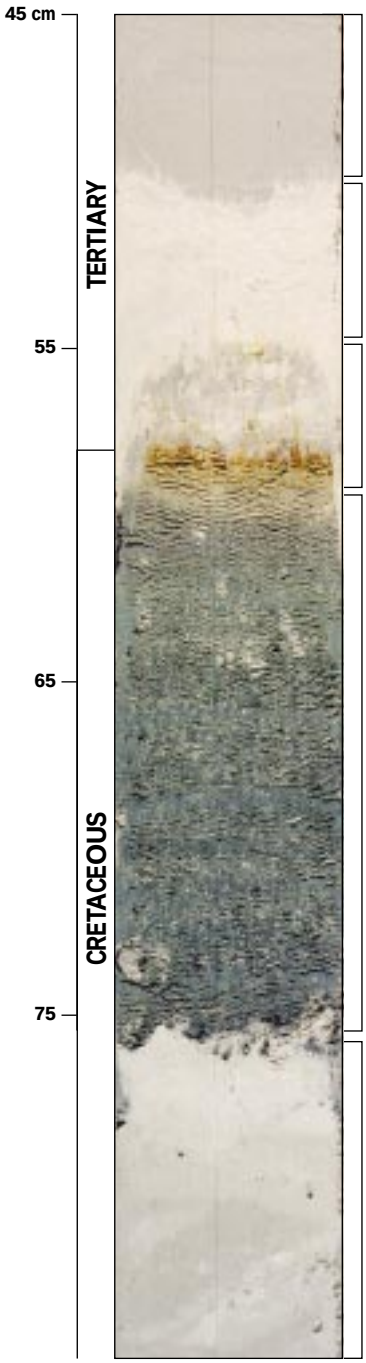
ODP results from the Atlantic Ocean, 300 miles off northeastern Florida, provide dramatic support for the long-standing theory that a large extraterrestrial object slammed into Earth about 65 million years ago at the Cretaceous-Tertiary (K/T) boundary. This event caused widespread extinctions of perhaps 70 percent of all species, including the dinosaurs. By drilling multiple holes at Site 1049 in 1997, ODP Leg 171B recovered three cores containing sedimentary layers that reveal — in beautiful detail — a cataclysmic story of destruction and biotic upheaval (see photograph). The lowermost impact layer contains a graded bed (6 to 17 cm thick) of green, silica-rich globules produced by the large meteorite impact. This spherule layer, which contains Cretaceous planktic foraminifera, forms a sharp contact with underlying nannofossil ooze (soft, microfossil-rich sediment) that was deposited before the catastrophe. The spherule layer also contains mineral grains and rock debris from the Chicxulub crater on Mexico's Yucatan Peninsula, the site of the presumed meteorite impact, over 1500 km away from Site 1049. The thin, rusty brown layer and the dark gray layer of bioturbated nannofossil ooze above it passes upwards into white nannofossil ooze of early Tertiary age, when survivors of the fireball repopulated the oceans. Notably, the dark gray ooze atop the rusty horizon contains only a few species of minute Cretaceous planktonic foraminifera suggesting that the spherule bed, and the bolide impact that produced it, were associated with a massive collapse of the oceanic ecosystem. Spherules were not observed at the K/T boundary at nearby Sites 1050 and 1052, although rocks from both the earliest Tertiary and the latest Cretaceous were recovered. The impact debris at these sites may have slumped into deeper water shortly after the impact debris fell from the sky, settled through the ocean, and arrived on the seafloor. These new ODP cores hold great research potential because unlike most K/T layers, those from Leg 171B are soft, unlithified, and the microfossils are extremely well preserved. This will enable scientists to conduct high-quality geochemical and paleontological studies of the post-apocalyptic repopulation of the ocean.

Cretaceous/Tertiary Boundary meteorite impact

ODP Leg 171B, Site 1049, Core 1049A, Section 17X-2



TERTIARY MICROORGANISMS
Return to "normal" conditions.

FIRST REPOPULATION OF THE "EMPTY SEAS"
New life evolves from survivors.

FALLOUT BED
Devoid of almost all life. Evidence of a few surviving microorganisms. Contains iridium anomaly and remains of the meteorite.

IMPACT EJECTA
Debris from the impact consists of a layer of graded, green, glassy globules, called tektites, as well as mineral grains and rock debris apparently derived from the Yucatan impact structure.

CRETACEOUS MICROORGANISMS
This layer contains signs of slumping perhaps caused by intense shock waves from the Chicxulub meteorite impact.