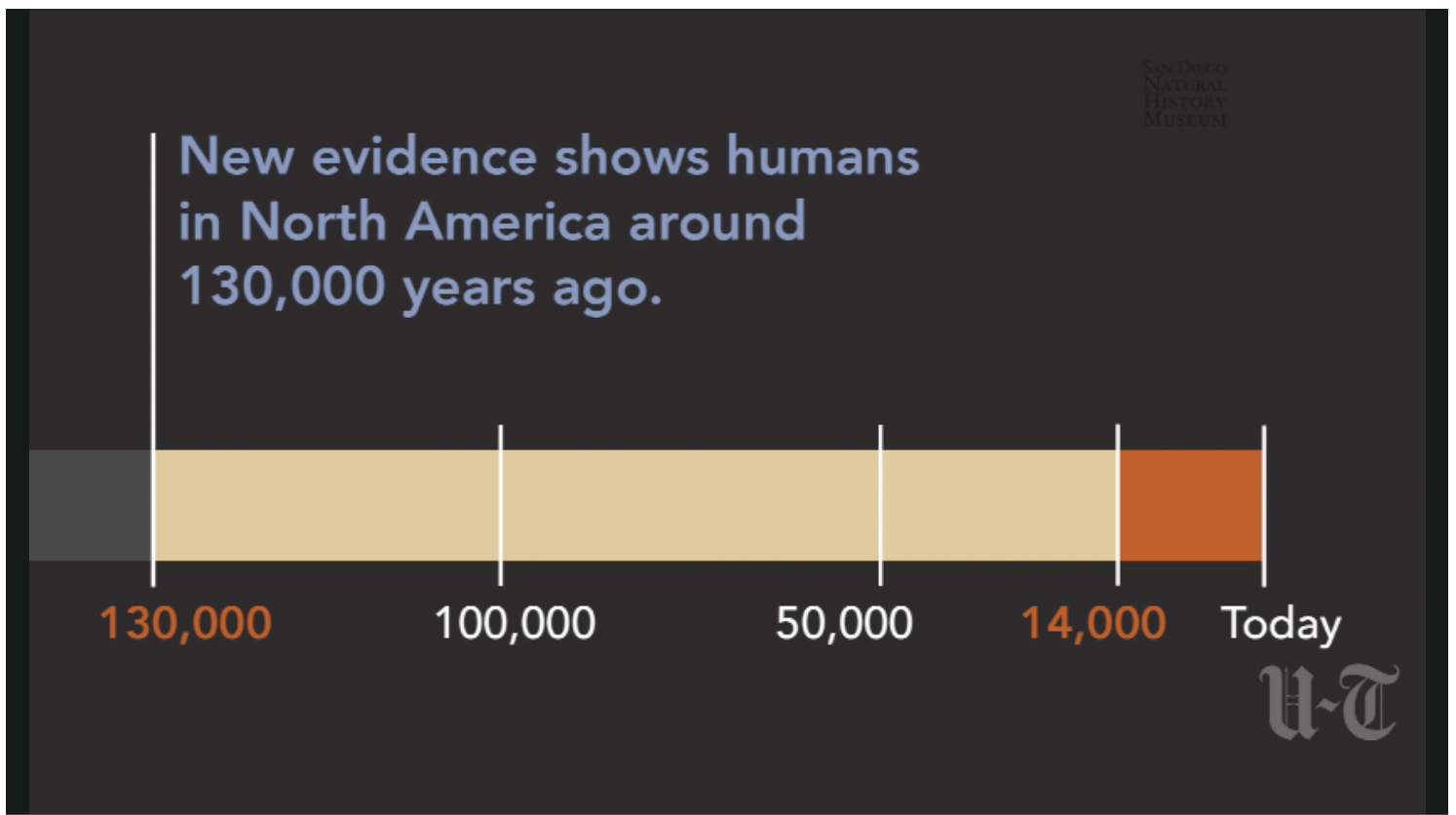


ENVIRONMENT

Mastodon bones place humans in America 130,000 years ago



In 1992, San Diego Natural History Museum paleontologists discovered the fossil remains of a mastodon, including its bones, molars and tusks, which show evidence of modification by early humans. Radiometric dating of the site completed in 2014 indic

By DEBORAH SULLIVAN BRENNAN

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San Diego — A trove of mastodon bones discovered decades ago at a CalTrans construction site in San Diego provides evidence that humans reached North America 100,000 years earlier than previously believed, according to a study published Wednesday in the journal Nature.

The renowned dig site, unearthed 25 years ago during a freeway expansion, yielded a wealth of remains from the shaggy, ancient beasts, including bones, tusks, and molars marred by blows from primitive tools. According to the study, it also dealt a surprise blow to the notion that humans are relatively new to the continent.

Recent tests of uranium decay in the bones date the entire site to 130,000 years ago — far earlier than previous estimates that traced the first human presence on the continent to 14,000 years ago. The findings rewrite the story of human expansion to the New World, scientists said, and illuminate the wanderlust that drove ancient people to test the boundaries of their world.

“Humans, we’re curious,” said Tom Demere, a co-author of the study and curator of paleontology for the San Diego Natural History Museum. “We want to explore. It’s just part of our DNA. That’s our evolutionary gift.”

The site — named in recognition of field paleontologist Richard Cerutti, who found the fossils and led the excavation — was discovered while scientists monitored the expansion of state Route 54 near National City in 1992.

Early on, paleontologists suspected that something didn’t add up.

The location lined up with geologic features called marine terraces that dated site at about 120,000 years old. An initial uranium dating also suggested that the remains were ancient, said James Paces, a research geologist with U.S. Geological Survey.

But the bones were fractured in a manner that early humans used to extract nutritious marrow. It looked like an archaeological site, but was just too old.

Starting in 2008, scientists took a fresh look at the fossils, using newer radiological dating methods. Uranium found in fossils decays into stable products at a steady rate, creating a time stamp that scientists can read by comparing the ratio of elements in the specimen. Recent developments in that process allow them to analyze the isotope ratios more accurately over smaller samples, Pace said.

He painstakingly studied samples across the bones, and came up with a date of 130,000 years old, plus or minus 9,400 years. Even at the lowest figure, it vastly extended the likely presence of humans in North

America.

“There’s a variety of evidence that suggests they are ancient materials,” he said.

The question, however, was whether the fossils bore fingerprints of human activity. To find out, the team brought in researchers who have studied mastodon remains in the U.S. and Siberia.

Bones manipulated by humans show a fracture pattern that doesn’t occur naturally. That’s what researchers found at the Cerutti site, said Daniel Fisher, a professor of paleontology at the University of Michigan. One fossil was even inserted vertically in the ground, as if placed there as a flag by early people, he said.

“In the end, the evidence points very clearly to humans being involved,” Fisher said. “We can rule out alternative explanations.”

Scientists aren’t sure whether the prehistoric hunters were part of a failed early colonization attempt, or whether they represent a long, but undetected human presence on the continent. In either case, the discovery dramatically shifts the timeline of human expansion to North America.

Cody Martinez, tribal chairman of the Sycuan Band of the Kumeyaay Nation, said the discovery is consistent with traditional beliefs that the Kumeyaay have lived in the area, “since time immemorial.”

“It’s really neat, to have a find like that,” Martinez said. “It’s an exciting surprise and definitely does fit in line with the traditional creation story of the Kumeyaay people.”

Natural History Museum President and CEO Judy Gradwohl, who came from a previous post at the Smithsonian Institution in Washington, D.C., said it’s not hard to see why people could have migrated to the temperate, coastal region thousands of centuries ago.

“As a recent transplant to this region, my personal conclusion about this research is that even early humans wanted to live in San Diego,” she said.

The discovery carves out new work for the researchers, who will revisit collections at the museum and at field sites to see if other fossil caches confirm or expand their findings. Specimens of Pleistocene mammals

found in Carlsbad and Oceanside show “interesting breakage” that could point to human involvement, Demere said.

The Cerutti site discovery is consistent with other worldwide research that is revising the tale of human migration, Fisher said.

“This is San Diego’s chance to contribute to the knowledge of human history,” he said.

The specimens recovered from the Cerutti mastodon site are now on display on Level 2 of the museum. The museum will host a public lecture featuring several of the Nature article authors at 7 p.m. Saturday.

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