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New Data Shed Light on Large-Animal Extinction

By [NICHOLAS WADE](#)

Whenever modern humans reached a new continent in the expansion from their African homeland 50,000 years ago, whether Australia, Europe or the Americas, all the large fauna quickly disappeared.

This circumstantial evidence from the fossil record suggests that people's first accomplishment upon reaching new territory was to hunt all its all large animals to death. But apologists for the human species have invoked all manner of alternative agents, like [climate change](#) and asteroid impacts.

A careful analysis of lake deposits in New York and Wisconsin has brought new data to bear on this heated debate. A team led by Jacquelyn Gill, a graduate student at the [University of Wisconsin](#), has uncovered a critical sequence of events that rules out some explanations for the extinction of the large animals and severely constrains others.

The first event documented by Ms. Gill and her colleagues is the pace of extinction in North America, known from other research to have affected all animal species over about 2,200 pounds and half of those weighing more than about 70 pounds, the weight of a large dog.

Ms. Gill found a clever proxy for these disappearances. A fungus known as *Sporormiella* has to pass through the digestive system to complete its life cycle, and its spores are found in animal dung. By measuring the number of spores in the lake deposits, the Wisconsin team documented the steady disappearance of large animals from 14,800 years to 13,700 years ago, they reported in Thursday's issue of *Science*.

The next clue to emerge from the lake deposits was the pollen of new plants including broad-leaved trees like oak. This novel plant community seems to have emerged because it was released from being grazed by large mammals.

The third clue is a layer of fine charcoal grains, presumably from fires that followed the buildup of wood.

This sequence of events has direct bearing on the megafauna whodunit. First, it rules out as the cause an impact by an asteroid or comet that occurred 12,900 years ago — the animals were dead long before.

It also excludes the standard version of a more popular explanation, that of habitat loss due to climate change. The extinction of large animals occurred before the emergence of the new plant communities. Ms. Gill said that some other aspect of climate, like direct temperature change, could have been involved.

The third suspect to be cleared is the people of the Clovis culture, which first appeared some 13,000 years ago, well after the extinction event. The Clovis people have long been considered the first inhabitants of North America, which they probably reached by trekking across the land bridge that joined Siberia and Alaska during the last Ice Age.

So, do the new data exculpate humans of the murder of the North American mammoth? Not exactly. Butchered mammoth bones some 14,500 years old have been found in Wisconsin. There were evidently pre-Clovis people in North America, and they could have hunted the large animals to death.

But Ms. Gill is not yet willing to declare people guilty. “At this stage it’s too early to completely eliminate climate change,” she said.

Nor is it clear that the pre-Clovis people had the technology to take down large game like mammoths. Ms. Gill plans to analyze many more lake bottoms before rendering any final verdict.