

Prehistoric impact idea smacked down

Analysis suggests dates of reported cosmic collision cannot explain North American extinctions.

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One of the most controversial ideas about prehistoric North America — that an impact by an extraterrestrial object 12,800 years ago triggered a cold snap that killed off mammoths and decimated early human populations — is under fresh attack. Independent archaeologists have reanalysed the dates of geological material that reportedly represents the impact, and found that they do not match.

Supporters of the impact theory have put forth 29 sites, from North America to Europe and beyond, that contain a thin layer of sediments said to date to the start of the cosmic impact event. The latest study checked to see whether those sites were all really 12,800 years old.

Only 3 of the 29 are, the researchers report today in the *Proceedings of the National Academy of Sciences*¹. The other sites either have not been dated using the usual radiometric methods, or are much older or younger than the reported impact. “The chronology doesn’t hold up,” says team leader David Meltzer, an archaeologist at Southern Methodist University in Dallas, Texas.

There is no doubt that something important happened in this region around 12,800 years ago. Temperatures in the Northern Hemisphere plummeted in a cold spell known as the Younger Dryas, and sophisticated hunters known as the Clovis people vanished from what is now the western United States. Many of North America’s famous large mammals, such as mammoths, went extinct.

Carbon footprint

Impact proponents say that many lines of evidence point to a cosmic object crashing into Earth at the time². These include reported tiny diamonds formed in the high pressure of an impact, and soot and charcoal from fires possibly triggered by the smash. Opponents counter that there are other explanations for these materials, and that a comet blast should have left a huge fingerprint in the geological record — but nothing of the sort has been found.

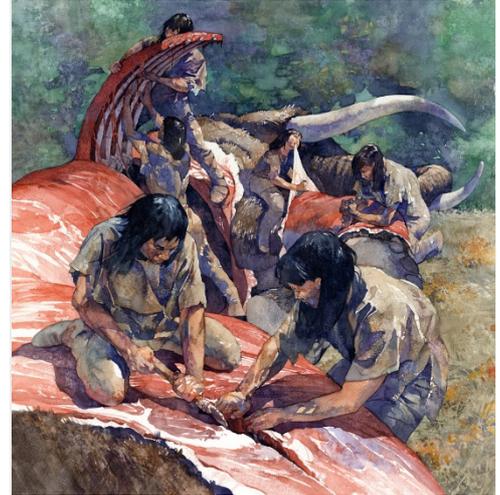
Meltzer’s team includes experts on North American Palaeoindians. “We know some of these sites, we’ve worked at some of these sites,” he says. “When we started to read the details [of the impact theory], it just didn’t add up.”

The researchers delved back through the original literature describing the 29 sites, checking the accuracy of claims for the locations being 12,800 years old. Many such links were tenuous, the team says. For instance, a glacial feature in Alberta, Canada, had been described as around 13,000 years old — but that date is based on a correlation with similar glacial features 2,600 kilometres away, which were formed by a different ice sheet.

In other places, radiocarbon dates described as 12,800 years old had been gathered hundreds of metres away from the purported impact layer. At Wally’s Beach in Alberta, the radiocarbon age came from the skull of an extinct musk ox. But the reported markers for the impact were found in sediment inside a different fossil, that of a horse skull.

Together, the dates fail to show that anything happened simultaneously in all 29 locations 12,800 years ago, Meltzer’s team concludes. “For now, there is no reason or evidence to accept the claim of an extraterrestrial impact,” the scientists write.

Impact supporters are not about to give up. “Meltzer’s analysis of the dates is overly simplistic and clearly biased towards his conclusions,” says Richard Firestone, a nuclear chemist at Lawrence Berkeley National Laboratory in California and leader of the impact theory. Errors in radiocarbon dating mean that not all of the sites will date precisely to 12,800 years ago, Firestone argues. And



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Researchers have sought an explanation for widespread deaths of mammoths and human populations in prehistoric North America.

much of his team's argument relies on cross-correlating various sites containing impact markers, some with good radiocarbon dates and some without.

Meltzer says that he would be happy to accept the impact theory if the evidence supported it. "We've kind of given it a shake and a rattle and a throttle," he says, "and there's just nothing there."

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References

1. Meltzer, D. J., Holliday, V. T., Cannon, M. D. & Miller, D. S. *Proc. Natl Acad. Sci. USA* <http://dx.doi.org/10.1073/pnas.1401150111> (2014).
2. Firestone, R. B. *et al. Proc. Natl Acad. Sci. USA* **104**, 16016–16021 (2007).