

Was America first colonised by two cultures at once?

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DNA clues from 14,300 year old human faeces (Image: Jeff Barnard/AP Photo/Press Association Images)

What a difference a day makes. Some 25 hours after a comprehensive genetic study suggested humans colonised North America in three successive migrational waves, a new study suggests there might have been a fourth.

Genetic evidence published on Wednesday by David Reich of Harvard Medical School in Boston suggests that there were at least three migrations into the Americas from Asia. The first, sometime before 13,000 years ago, was the most important, leaving descendants throughout the two continents. The other two came later, and remained in the far north (Nature, DOI: 10.1038/nature11258).

However, while Reich used samples from contemporary Native American groups in Canada, Central and Southern America, he had virtually no data from those in the US, because of political problems over the use of samples.

Today, Eske Willerslev of the University of Copenhagen in Denmark and colleagues report results of their analysis of stone tools and human DNA from the Paisley Caves in Oregon. The result suggests there may have been two migrations before 13,000 years ago rather than one. Because Reich identified two later migrations, the new result suggests there may have been four migrations into the Americas in total.

Coprolite DNA

Willerslev and his colleagues first studied the caves in 2008. His team found ancient human faeces – coprolites – that proved to be 14,300 years old. The coprolites yielded human DNA similar to that of Native Americans and people in east Asia

(Science, DOI: 10.1126/science.1154116).

The findings were met by a torrent of criticism, mostly focused on the age of the samples and on whether they had been contaminated by people who entered the cave later. Someone could have urinated on the cave floor, for example, and their DNA could have seeped into the fossilised faeces.

Willerslev has now re-analysed the samples to confirm their age. He also examined coprolites from other animals in the caves and found that they didn't contain any human DNA, suggesting that there was no significant contamination.

"This paper puts the criticisms to rest," says David Meltzer of Southern Methodist University in Dallas, Texas.

Two migrations

Until a few years ago, the consensus was that the first American colonists were the Clovis people, who first appeared around 13,000 years ago. They made distinctive pointed stone tools.

The stone tools that Willerslev found in the cave are a similar age to these tools – they are about 12,800 years old – but are unlike any made by the Clovis people. They are most similar to tools found on the west coast of the US called Western Stemmed projectiles. Until now the oldest known Western Stemmed projectiles were around 10,700 years old, which suggested they were a later development. Willerslev's data shows that the two stone cultures were contemporaries.

Willerslev thinks the Western Stemmed projectiles were made by the first migrants into America, who came in by sea on the west coast while the continental interior was still covered in ice. The Clovis tools were the product of a second group, who came in through Alaska and Canada later, after the ice had retreated.

Meltzer is unconvinced by the additional migration idea. He says there could have been just one early migration that came in by sea. The population could then have divided, and developed different tool technologies in isolation.

Willerslev thinks that's less likely. He points out that if there was only one initial migration it must have occurred very early to give the population time to split in two and the two groups to develop radically different tools.

There is evidence that the earliest migrations may indeed have been very early. Last year, for example, archaeologists discovered a hoard of crude tools from the southern state of Texas that dates to 15,500 years ago – 2500 years before the Clovis culture emerged.

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