

Neanderthals were nifty at controlling fire: study

March 14 2011



A new study involving the University of Colorado Boulder indicates Neanderthals had achieved continuous control of fire by roughly 400,000 years ago. Credit: JPL/NASA

A new study involving the University of Colorado Boulder shows clear evidence of the continuous control of fire by Neanderthals in Europe dating back roughly 400,000 years, yet another indication that they weren't dimwitted brutes as often portrayed.

The conclusion comes from the study of scores of ancient [archaeological research](#) sites in Europe that show convincing evidence of long-term [fire](#) control by [Neanderthals](#), said Paola Villa, a curator at the University of Colorado Museum of Natural History. Villa co-authored a paper on the new study with Professor Wil Roebroeks of Leiden University in the

Netherlands.

"Until now, many scientists have thought Neanderthals had some fires but did not have continuous use of fire," said Villa. "We were not expecting to find a record of so many Neanderthal sites exhibiting such good evidence of the sustained use of fire over time."

A paper on the subject was published in the March 14 issue of the [Proceedings of the National Academy of Sciences](#).

Neanderthals are thought to have evolved in Europe roughly 400,000 to 500,000 years ago and went extinct about 30,000 years ago.

Neanderthals ranged over much of Europe and stretched to Central Asia. Neanderthals were stockier than anatomically modern humans and even shared the same terrain for a time, and there is evidence that contemporary humans carry a small amount of Neanderthal DNA. Modern humans began migrating out of Africa to Europe some 40,000 years ago.

Archaeologists consider the emergence of stone tool manufacturing and the control of fire as the two hallmark events in the technological evolution of [early humans](#). While experts agree the origins of stone tools date back at least 2.5 million years in Africa, the origin of fire control has been a prolonged and heated debate.

Villa and Roebroeks, who together speak and read six languages, have visited or worked at dozens of the Neanderthal excavation sites in Europe. They also combed libraries throughout Europe and the United States for research papers on evidence for early fire use in Europe, contacting researchers involved in the excavations when possible for additional information and insight.

As part of the study they created a database of 141 potential fireplace

sites in Europe dating from 1.2 million years ago to 35,000 years ago, assigning an index of confidence to each site. Evidence for the sustained use of fire includes the presence of charcoal, heated stone artifacts, burned bones, heated sediments, hearths and rough dates obtained from heated stone artifacts. Sites with two or more of the characteristics were interpreted as solid evidence for the control of fire by the inhabitants.

The second major finding in the PNAS study -- perhaps even more surprising than the first -- was that Neanderthal predecessors pushed into Europe's colder northern latitudes more than 800,000 years ago without the habitual control of fire, said Roebroeks. Archaeologists have long believed the control of fire was necessary for migrating early humans as a way to reduce their energy loss during winters when temperatures plunged below freezing and resources became more scarce.

"This confirms a suspicion we had that went against the opinions of most scientists, who believed it was impossible for humans to penetrate into cold, temperate regions without fire," Villa said.

Recent evidence from an 800,000-year-old site in England known as Happisburgh indicates hominids -- likely *Homo heidelbergensis*, the forerunner of Neanderthals -- adapted to chilly environments in the region without fire, Roebroeks said.

The simplest explanation is that there was no habitual use of fire by early humans prior to roughly 400,000 years ago, indicating that fire was not an essential component of the behavior of the first occupants of Europe's northern latitudes, said Roebroeks. "It is difficult to imagine these people occupying very cold climates without fire, yet this seems to be the case."

While the oldest traces of human presence in Europe date to more than 1 million years ago, the earliest evidence of habitual Neanderthal fire use

comes from the Beeches Pit site in England dating to roughly 400,000 years ago, said Villa. The site contained scattered pieces of heated flint, evidence of burned bones at high temperatures, and individual pockets of previously heated sediments. Neanderthals, like other early humans, created and used a unique potpourri of stone tools, evidence that they were the ancient inhabitants of particular sites in Europe.

The sites catalogued by the team were dated by several methods, including electron spin resonance, paleomagnetism and thermoluminescence. Some research teams also have used microscopic studies of sediment at sites to confirm the presence of ashes. While some of the best evidence for controlled use of fire in Europe comes from caves, there are many open-air sites with solid evidence of controlled fire, they said.

According to Villa, one of the most spectacular uses of fire by Neanderthals was in the production of a sticky liquid called pitch from the bark of birch trees that was used by Neanderthals to haft, or fit wooden shafts on, [stone tools](#). Since the only way to create pitch from the trees is to burn bark peels in the absence of air, archaeologists surmise Neanderthals dug holes in the ground, inserted birch bark peels, lit them and covered the hole tightly with stones to block incoming air.

"This means Neanderthals were not only able to use naturally occurring adhesive gums as part of their daily lives, they were actually able to manufacture their own," Villa said. "For those who say Neanderthals did not have elevated mental capacities, I think this is good evidence to the contrary."

Many archaeologists believe Neanderthals and other early hominids struck pieces of flint with chunks of iron pyrite to create the sparks that made fire and may well have conserved and transported fire from site to site.

Some anthropologists have proposed that Neanderthals became extinct because their cognitive abilities were inferior, including a lack of long-term planning, said Villa. But the archaeological record shows Neanderthals drove herds of big game animals into dead-end ravines and ambushed them, as evidenced by repeatedly used kill sites -- a sign of long-term planning and coordination among hunters, she said.

Recent findings have even indicated Neanderthals were cooking, as evidenced by tiny bits of cooked plant material recovered from their teeth.

Provided by University of Colorado at Boulder

Citation: Neanderthals were nifty at controlling fire: study (2011, March 14) retrieved 27 April 2024 from <https://phys.org/news/2011-03-neanderthals-nifty.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.