

## The Earliest Example of Hominid Fire

New research reveals hominids were building fires one million years ago, pushing back the origins of controlled fire by more than half a million years

By [Erin Wayman](#) SMITHSONIAN.COM APRIL 4, 2012



**New research suggests hominids were building fire by at least one million years ago. Image courtesy of**

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Discussions of fire and human evolution conjure up images of cavemen sitting around a campfire roasting chunks of meat on sticks. But who were the first “cavemen” to do this? Debate goes back and forth between anthropologists who claim hominids began controlling fire nearly two million years ago and those who think our ancestors started stoking flames only a few hundred thousand years ago.

Now a new study of one-million-year-old charred bones and plant remains provides the earliest “secure” evidence of hominid fire-making, researchers say.

The new evidence comes from South Africa’s [Wonderwerk Cave](#). Archaeological investigations there in the 1970s through 1990s turned up [Acheulean tools](#)—stone handaxes and other implements that were likely produced by *Homo erectus*. In 2004, Francesco Berna of Boston University and his colleagues began new excavations. They found several signs of fire, including tiny charred bone fragments and ash from burned plants. They also found ironstone—which the hominids used to make tools—with telltale fractures indicative of heating. Using a technique called [Fourier transform infrared microspectroscopy](#), which examines how a sample absorbs different wavelengths of infrared light, the team determined the remains had been heated to more than 900 degrees Fahrenheit, with grasses, leaves or brush used as fuel.

The shape of the bone fragments and the exceptional preservation of the plant ash suggest the materials were burned in the cave—not outside and then transported in by water, the team reports this week in [Proceedings of the National Academy of Sciences](#). Spontaneous combustion of bat guano was also ruled out (apparently this sometimes happens in caves). That left hominids as the most likely source of the fire.

This is good news for Harvard University’s Richard Wrangham and supporters of his [cooking hypothesis](#). According to Wrangham, mastering fire was a transformative event in the history of humans. It allowed our ancestors to cook. And because cooked food is easier to digest, the hominid gut shrank, freeing up energy that was then devoted to fueling the evolution of bigger brains, which are very expensive to maintain, energetically speaking. ([Brain tissue needs 22 times as much energy as an equivalent amount of muscle.](#))

Wrangham surmised this important transition must have occurred with the origin of *Homo erectus*, some 1.9 million years ago, when brain size really began to expand and the hominid body became taller and more modern.

The fire at Wonderwerk is too young to fully support Wrangham's hypothesis, but it's a step in the right direction. Previously, the earliest well-accepted instance of fire-building came from Israel's Qesem Cave at 400,000 years ago. For claims of much older examples of controlled fire, such as at a 1.5-million-year-old Kenyan site called Koobi Fora, wildfires couldn't be ruled out.

If the history of fire extends back one million years, why don't archaeologists find more evidence of it? Last year, for example, Wil Roebroeks of Leiden University in the Netherlands and Paola Villa of the University of Colorado Museum in Boulder surveyed the European archaeological record of the last 1.7 million years. They didn't find habitual use of fire until about 400,000 years ago, they reported in [Proceedings of the National Academy of Sciences](#), leading them to conclude hominids must have colonized the northern latitudes without fire's warmth.

Berna's team thinks the problem might be in how archaeologists have been looking for fire. The new research involved examining the cave sediments, bones and plant ash at a microscopic level, which revealed information that's normally overlooked. Perhaps with the help of such microscopic methods, anthropologists will find that the origin of fire is indeed linked to the origin of *Homo erectus*.

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