

Oldest DNA ever found sheds light on humans' global trek

October 22 2014, by Richard Ingham



The Ust'-Ishim femur. Credit: Bence Viola, MPI EVA

Scientists said Wednesday they had unravelled the oldest DNA ever retrieved from a Homo sapiens bone, a feat that sheds light on modern humans' colonisation of the planet.

A femur found by chance on the banks of a west Siberian river in 2008 is that of a man who died around 45,000 years ago, they said.

Teased out of collagen in the ancient bone, the genome contains traces from Neanderthals—a cousin species who lived in Eurasia alongside *H. sapiens* before mysteriously disappearing.

Previous research has found that Neanderthals and *H. sapiens* interbred, leaving a tiny Neanderthal imprint of just about two percent in humans today, except for Africans.

The discovery has a bearing on the so-called "Out of Africa" scenario: the theory that *H. sapiens* evolved in East Africa around 200,000 years ago and then ventured out of the continent.

Dating when Neanderthals and *H. sapiens* interbred would also indicate when *H. sapiens* embarked on a key phase of this trek—the push out of Eurasia and into South and later Southeast Asia.

The new study, published in the journal *Nature*, was headed by Svante Paabo, a renowned geneticist at the Max Planck Institute for Evolutionary Anthropology in Leipzig, Germany, who has pioneered research into Neanderthals.

Neanderthal interbreeding

The bone found at the Irtyush River, near the settlement of Ust'-Ishim, carries slightly more Neanderthal DNA than non-Africans today, the team found.

But it takes the form of relatively long strips, whereas Neanderthal DNA in our genome today has been cut up and dispersed in tiny sections as a result of generations of reproduction.



Svante Pääbo and Nikolay Peristov discuss the Ust'-Ishim discovery. Credit: Bence Viola, MPI EVA

These differences provide a clue for a "molecular calendar", or dating DNA according to mutations over thousands of years.

Using this method, Paabo's team estimate interbreeding between Neanderthals and *H. sapiens* occurred 7,000 to 13,000 years before the Siberian individual lived—thus no more than 60,000 years ago.

This provides a rough date for estimating when *H. sapiens* headed into South Asia, Chris Stringer, a professor at Britain's Natural History Museum, said in a comment on the study.

If today's Australasians have Neanderthal DNA, it is because their forebears crossed through Neanderthal territory and mingled with the locals.

"The ancestors of Australasians, with their similar input of Neanderthal

DNA to Eurasians, must have been part of a late, rather than early, dispersal through Neanderthal territory," Stringer said in a press release.

"While it is still possible that [modern humans](#) did traverse southern Asia before 60,000 years ago, those groups could not have made a significant contribution to the surviving modern populations outside of Africa, which contain evidence of interbreeding with Neanderthals."

Anthropologists suggest a northern branch of Eurasians crossed to modern-day Alaska more than 15,000 years ago via an "ice bridge" that connected islands in the Bering Strait, thus enabling *H. sapiens* to colonise the Americas.

More information: *Nature*, [dx.doi.org/10.1038/nature13810](https://doi.org/10.1038/nature13810)

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