

Neanderthals died out earlier than originally believed

May 10 2011, by Deborah Braconnier



Homo neanderthalensis, adult male. Credit: John Gurche, artist / Chip Clark, photographer

(PhysOrg.com) -- According to a newly released report in *The Proceedings of the National Academy of Sciences*, a newly refined method of radiocarbon dating has found that Neanderthals died off much earlier than originally believed. Where previous testing had shown fossils as young as 29,000 years ago, this new method puts the date closer to 39,000 years ago, sparking the debate that Neanderthals and modern humans probably never interacted in Europe.

A specialist in [radiocarbon dating](#) from [Oxford University](#), Thomas F. G. Higham developed a new method of radiocarbon dating with ultrafiltration which is able to remove contaminants to better receive an accurate dating. Radiocarbon dating measures a [radioactive isotope](#)

carbon (carbon 14) which decays at a predictable rate after death. In specimens older than 30,000 years, very little carbon remains.

Higham, along with archaeologist Ron Pinhasi from University College Cork in Ireland examined the bones from a Neanderthal child found in the Mezmaiskaya Cave location in the northern Caucasus Mountains. Their new radiocarbon dating method put this fossil at 39,700 years old. A previously found fossil at this site had been dated at 29,000 and was being re-examined with the new method.

Higham is re-dating Neanderthal sites throughout Europe and believes all remains will be changed with none begin younger than 39,000 years old. Because of this new find, he believes there is now no evidence that Neanderthals and modern humans were co-existing in Europe for very long at all, and that there is even the possibility that the Neanderthals demise was at the hands of the modern human.

This is where the debate begins, as geneticists reported last year that 2.5 percent of the modern human genome is derived from the [Neanderthal genome](#). There is evidence of [Neanderthals](#) co-existing in the Near East some 100,000 years ago, as well as in Europe 40,000 years ago. With the new carbon dating timeline, it is now believed that interbreeding between the two did not occur in Europe but rather during that first encounter.

More information: Revised age of late Neanderthal occupation and the end of the Middle Paleolithic in the northern Caucasus, *PNAS*, Published online before print May 9, 2011, [doi: 10.1073/pnas.1018938108](#)

Abstract

Advances in direct radiocarbon dating of Neanderthal and anatomically modern human (AMH) fossils and the development of

archaeostratigraphic chronologies now allow refined regional models for Neanderthal–AMH coexistence. In addition, they allow us to explore the issue of late Neanderthal survival in regions of Western Eurasia located within early routes of AMH expansion such as the Caucasus. Here we report the direct radiocarbon (^{14}C) dating of a late Neanderthal specimen from a Late Middle Paleolithic (LMP) layer in Mezmaiskaya Cave, northern Caucasus. Additionally, we provide a more accurate chronology for the timing of Neanderthal extinction in the region through a robust series of 16 ultrafiltered bone collagen radiocarbon dates from LMP layers and using Bayesian modeling to produce a boundary probability distribution function corresponding to the end of the LMP at Mezmaiskaya. The direct date of the fossil ($39,700 \pm 1,100$ ^{14}C BP) is in good agreement with the probability distribution function, indicating at a high level of probability that Neanderthals did not survive at Mezmaiskaya Cave after 39 ka cal BP ("calendrical" age in kiloannum before present, based on IntCal09 calibration curve). This challenges previous claims for late Neanderthal survival in the northern Caucasus. We see striking and largely synchronous chronometric similarities between the Bayesian age modeling for the end of the LMP at Mezmaiskaya and chronometric data from Ortvale Klde for the end of the LMP in the southern Caucasus. Our results confirm the lack of reliably dated Neanderthal fossils younger than ~ 40 ka cal BP in any other region of Western Eurasia, including the Caucasus.

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