

Neandertal Lineage Began in a "Game of Thrones" World

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[Kate Wong](#) June 19, 2014



Skull from the Sima de los Huesos site in Spain shows early Neandertal features.
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In a small chamber deep in the Atapuerca mountains in northern Spain lies one of the most extraordinary paleontological discoveries of all time: a massive assemblage of fossils belonging to an extinct member of the human family. The site is known as the Sima de los Huesos, the "pit of bones." And in it scientists have found clues to the origin of

[Neandertals.](#)

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Researchers have been excavating the site for years, recovering more than 6,500 bones from at least 28 individuals to date. The find offers a rare chance to study a prehistoric population, as opposed to an individual. Now a new analysis of 17 skulls from the site is yielding fresh insights. In a paper published today in *Science*, Juan Luis Arsuaga of the Centro Mixto UCM-ISII de Evolución y Comportamiento Humanos in

Madrid and his colleagues report that the fossils show that Neandertals have deep evolutionary roots, and that their distinctive traits evolved piecemeal rather than as a package deal.

The Sima skulls date to around 430,000 years ago, during the Middle Pleistocene—a poorly understood period of human evolution. And they exhibit some [key Neandertal characteristics](#), including a projecting midface, as well as a number of features in the teeth and jaws. They are the oldest fossils to show such affinities to our Neandertal cousins. But they lack the classic Neandertal “chignon” (a mound of bone at the rear of the skull) and other aspects of the Neandertal braincase. All told this mix of Neandertal and non-Neandertal traits indicates to the team that the Sima fossils represent an early member of the Neandertal clade—not *Homo neanderthalensis*, but a closely related species or subspecies.

Arsuaga and his colleagues observe that the Neandertal traits evident in the Sima skulls all relate to chewing, suggesting that “the origin of the Neandertal clade coincides with a masticatory specialization.” But exactly what the specialization was is not yet clear, though researchers have previously argued that the Neandertals used their [teeth](#) as a grasping tool while preparing animal hides or processing food. For example, they might have gripped one end of a hide with one hand and the other end with their teeth, leaving one hand free to scrape the fur from the skin.

Only later in the evolution of the Neandertal lineage did brain size expand, attaining a volume close to that of anatomically modern *H. sapiens*. Yet though these increases in size occurred in parallel in the Neandertal and *H. sapiens* lineages, they did not produce identical brains in the two groups. In a commentary accompanying the *Science* report, paleoanthropologist Jean-Jacques Hublin of the Max Planck Institute for Evolutionary Anthropology in Leipzig notes that “there is clear evidence that the growth pattern of modern human brains [deviates from that of Neandertals](#). In modern humans, parietal areas and cerebellum expand in

early infancy, at a crucial stage for the establishment of cognitive skills."

At a press teleconference, Arsuaga likened Middle Pleistocene Europe to a Game of Thrones world in which different populations across the continent variously competed and co-mingled as they struggled to survive ice age climate swings. "Winter was coming," he said. "Winter came many times."

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