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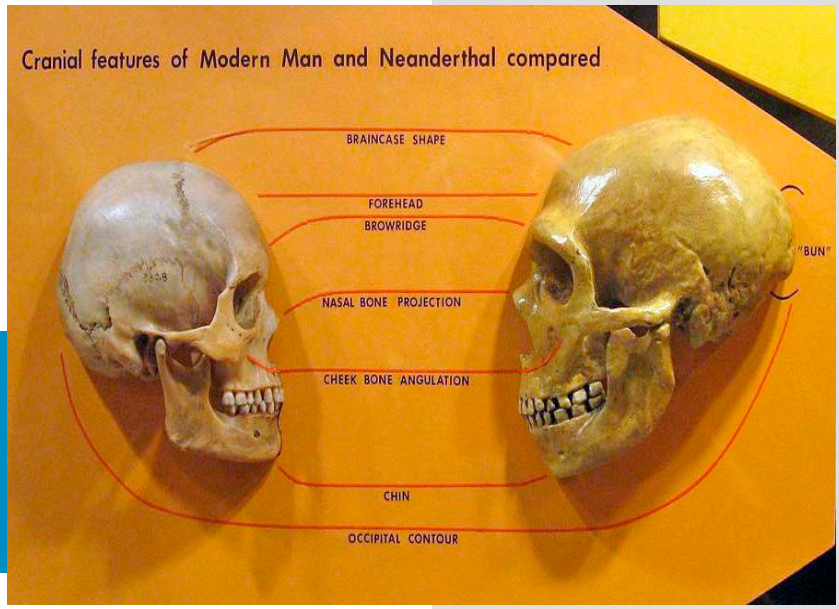
Who Killed the Neanderthals?



Comparison of Neanderthal and modern human skulls from the Cleveland Museum of Natural History.

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Shortly after modern humans arrived in Europe, the Neanderthals disappeared. And scientists think we had something to do with it.

Neanderthals, or their direct ancestors, migrated out of Africa and into the Middle East and Europe around 250,000 years ago. Soon they were well adapted to the environment.

Large eyes helped them see in the longer nights and darker winters. Stout bodies helped them retain heat and handle large prey, and provided space for the large liver and kidneys needed for a diet heavy in protein.

Their brains were as big as ours but spent processing power on their greater visual and motor abilities. This may not have allowed them to develop higher communication or conceptual thinking to match ours. Which may have been their downfall.

Modern humans arrived on the scene 45,000 years ago, less physically adapted but more mentally adaptable.

We had cooperative hunting methods superior to the Neanderthals', allowing us to out-compete them for food and perhaps reducing the large herbivore populations that they depended on.

We also had superior tools and weapons. When there were conflicts between the groups—as there have been among tribes throughout history—our superior technology probably allowed us to prevail.

But we weren't only fighting. There must have been considerable interbreeding, since we can find 1 to 3 percent of the Neanderthal genome in modern man.

Which means the Neanderthals never completely disappeared. A little bit of them is alive in us today.

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Background: Who Killed the Neanderthals?

Synopsis: Neanderthals were hominids that roamed through Europe, the Middle East, and Eurasia starting about 250,000 years ago. They disappeared between 41,000 and 39,000 years ago. What factors could have caused such an abrupt end for their species?

- *Homo neanderthalensis* and *Homo sapiens* share 99.7 percent or more of their DNA.
  - Modern humans lived in Africa more than 300,000 years ago, some leaving for the Middle East about 195,000 to 70,000 years ago. They lived in the same territory as Neanderthals from about 60,000 to 50,000 years ago and probably entered Europe between 45,000 and 43,000 years ago.
  - Genome studies show that most people outside of sub-Saharan Africa today have 2–3 percent Neanderthal DNA. Studies show that interbreeding occurred between the species starting at least 60,000 years ago.
- Both Neanderthals and modern humans used fire, made stone tools, and hunted, but they had physical differences.
  - Neanderthals had cranial capacities that were about 25 percent larger than those of *Homo sapiens*.
  - Their eye sockets were larger and areas of the brain dedicated to vision were larger, so they may have had better vision.
  - They had smaller chins and larger noses, with a pronounced bony brow ridge.
  - Neanderthals were more robustly built, with shorter limbs and a wider rib cage, which may have helped to preserve body heat in cold northern climates and housed larger internal organs.
  - Male Neanderthals were around 65–66 inches tall and females were around 60–61 inches tall.
  - Anatomical studies suggest their arms and hands were stronger than those of humans.
  - Genetic studies show that a small percentage had light skin and red to blond hair color.
  - Neanderthals had ridges on their finger bones similar to those of chimpanzees, which indicate that infants may have grabbed their mother's fur—suggesting that Neanderthals were furrier than *Homo sapiens*.
  - Neanderthal sites do not include tools for making clothing, like bone needles or bone awls, which are common at human sites. Wear on Neanderthal scrapers suggest they may have prepared furs and skins for blankets but nothing more.
  - Studies of fossil plaque on their teeth shows us that Neanderthals ate sheep, deer, reindeer, ibex, wild boar, aurochs, and occasionally woolly mammoth, with vegetables as filler. But some Neanderthal groups in what is now Spain were vegetarians, eating moss, pine nuts, and mushrooms.
- Why do researchers think the Neanderthals became extinct? One or more of the following factors may have contributed:
  - A massive volcanic eruption occurred about 39,000 years ago near the current location of Naples, Italy.
    - Ash from the eruption is found at cultural breaks from Paleolithic sites, indicating migration occurred at the time of this ashfall.
    - The eruption is thought to have further cooled the chilly Pleistocene climate.
    - As grazing areas diminished in the frigid north, herbivores migrated southward, resulting in intensified competition among hominid bands as hunters followed their prey southward.

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References: Who Killed the Neanderthals?

Neanderthal | Wikipedia
Did Neanderthals Die Out Because of the Paleo Diet? | Smithsonian
Scientists Delve Into Neanderthal Dental Plaque | Smithsonian
How Hunting with Wolves Helped Humans Outsmart the Neanderthals | The Guardian
Neanderthals May Have Died of Diseases Carried by Humans from Africa | The Guardian
Modern Humans and Neanderthals May Be More Similar Than We Imagined | Smithsonian

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- Violent conflict between competing hunter–gatherer societies *Homo sapiens* and *Homo neanderthalensis* may have occurred.
  - Grooves in bones from spear tips and other weapons have been found in remains from both species.
  - Conflict may have also occurred between groups of the same species, as we see today among humans.
- Humans, Neanderthals, wolves, and felines were all apex predators who competed to hunt and kill large prey mammals.
  - Some researchers believe that around the time humans entered Europe, they joined forces with wolves to hunt together, initiating the domestication process that would lead to the evolution of dogs.
  - Domesticated dog remains in the region, with head and jaw configurations different from those of wolves, have been dated at up to 33,000 years old and found near human settlements.
  - Neanderthal settlements show no evidence of relationships with canines, suggesting they did not take advantage of teaming up with dogs.
- Neanderthals lived and hunted in smaller, more isolated social groups.
  - Neanderthal men and women both participated in hunting big game, gambling that the hunt would pay off if all helped.
  - Modern humans used efficient division of labor to both hunt and gather food, ensuring that the group ate even if no game had been caught.
- Neanderthals were stockier and had shorter lower limbs than humans.
  - Anatomically, their wider pelvises appear to have been less able to absorb the shock of bouncing from step to step, which may have limited their walking and running ability compared to that of humans.
    - As larger prey progressively disappeared from the tundra, the hunt for smaller, faster prey meant Neanderthals might have been disadvantaged.
  - Neanderthals had ribcages that were larger and more bell-shaped than those of humans.
    - Some researchers attribute this shape to the need for a larger respiratory system in the cooler, drier environments where they lived.
    - Other researchers believe that living on the more northerly tundra with limited vegetation required them to eat a "Paleo Diet" of animal meat with high levels of protein that caused them to develop enlarged livers and kidneys to metabolize the protein, further increasing the size of their torsos. (Inuits who inhabit northern tundra environments and sometimes subsist on all-meat diets also exhibit larger livers and kidneys, as well as longer ribs.)
- Diseases and parasites brought from Africa by modern humans may have proven lethal to Neanderthals in Europe, who would have had limited or no immunity to these more tropical diseases.
  - The bacterium that causes stomach ulcers, *Helicobacter pylori*, infected humans in Africa—thus creating immunities in humans—more than 30,000 years before infecting Neanderthal populations in Europe.
  - Other viruses, infections, and parasites transmitted to Neanderthals by humans included tuberculosis and tapeworm.

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