PIECING TOGETHER THE PUZZLE OF THE PAST

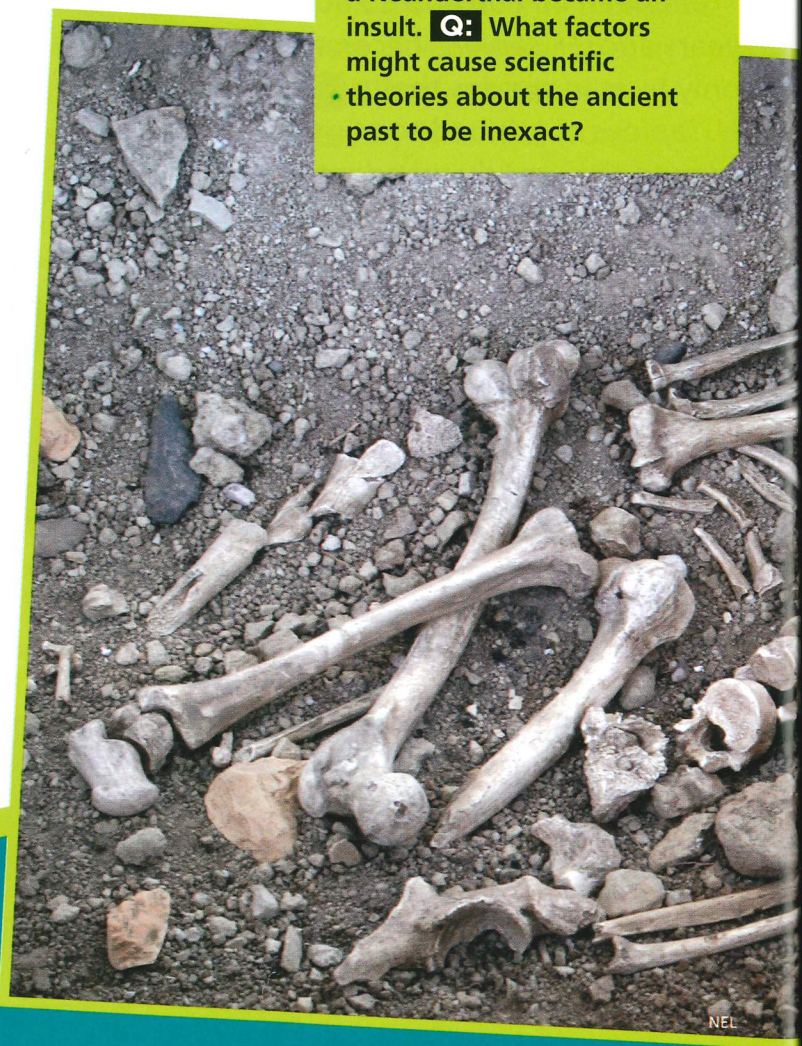
Scientists study evidence, such as bones, fossils, oral histories, genetic testing, and artifacts, to create theories about what happened in the past. But these theories may change when evidence is reviewed and new evidence is discovered.

The case of "the old man of La Chapelle," the ancient skeleton of a Neanderthal, shows how scientific theories can change. The skeleton was found in 1908. Paleontologist Pierre Marcellin Boule reconstructed the skeleton and concluded that the skull was like an ape's skull. He also concluded that the old man's curved spine showed that he had walked with an ape-like slouch.

But in the 1950s, scientists re-examined the skeleton. These scientists concluded that the old man's slouch was caused by osteoarthritis, a bone disease that had deformed his spine. His slouch was not typical of Neanderthals.

Later, other scientists concluded that Boule's personal beliefs had influenced his conclusions. They said that Boule did not believe that Neanderthals could be the ancestors of humans. So he interpreted the evidence to support his theory that Neanderthals were more ape-like than human.

Archaeologists have discovered artifacts, including personal ornaments, at sites where Neanderthals once lived. This new evidence has led scientists to believe that Neanderthals created ornaments that were symbolic for them. As a result, scientists have concluded that Neanderthals could think deeply—and were not as inferior to *H. sapiens* as once thought.



This is the skeleton of the old man of La Chapelle. It was found in a small cave in present-day France. Because of the way Boule interpreted this evidence, people thought Neanderthals were brutish and stupid. Calling someone a Neanderthal became an insult. Q: What factors might cause scientific theories about the ancient past to be inexact?

Both Neanderthals and *H. sapiens* lived during the most recent **ice age**, which lasted from about 90 000 years ago to about 11 500 years ago. The climate was very cold and harsh. By the end of this ice age, Neanderthals were extinct.

> "Some would say Neanderthals didn't go extinct, because everyone alive today whose ancestry is from outside of Africa (where Neanderthals never lived) carries a little bit of Neanderthal DNA in their genes."
>
> – Briana Pobiner, *paleoanthropologist, Smithsonian Institution*

WHY NEANDERTHALS DIED OUT

In the* Smithsonian Insider*, scientist Briana Pobiner explained current theories about why Neanderthals became extinct while* H. sapiens *survived.

In the case of Neanderthals, we think competition and changes to their habitat due to climate change were two of the main factors. Neanderthals were fairly specialized to hunt large, Ice Age animals. But sometimes being specialized isn't such a good strategy. When climates changed and some of those animals went extinct, the Neanderthals may have been more vulnerable to starvation.

We also think *Homo sapiens* had a competitive edge over Neanderthals. There is evidence that early *Homo sapiens* had long-distance trade networks, possibly buffering them against times of climate change when their preferred foods were not available; Neanderthals did not.

Neanderthals had physical features that helped them survive cold climates, like large noses to humidify and warm dry, cold air and short, stout bodies to conserve heat. But early *Homo sapiens* had technology that Neanderthals didn't, including sewing needles to make clothing, important during the colder periods of the Ice Ages. *Homo sapiens* also had innovative tools like bows and arrows and seemed to have a more diverse diet than Neanderthals.

Archaeologists have discovered shells and shell beads at sites where *H. sapiens* lived. These sites are far from the seas where the shells originated. Q: How does this evidence support the conclusions that Briana Pobiner set out in the *Smithsonian Insider*?