A TALE OF TWO SPECIES  BY MICHAEL PRICE
Picture a cool day 35,000 years ago. The location is a rocky valley in what today would be northern Spain. A stream trickles around the base of a peak as a woman leans out over the water looking for fish. On the horizon, a figure appears. As it gets closer, the features come into focus. It's a male. He's tall, robust and muscular, with pale skin. His eyes peer out beneath thick brow ridges. The male is a Neanderthal. Their eyes meet. What emotion lies buried beneath that gaze? Is it anger? Confusion? Love at first sight? We may never know the answer, but the scenario is plausible, says Ana Pinto. Pinto is a Spanish zooarchaeologist. She recently completed postdoctoral work at Arizona State University’s world renowned Institute of Human Origins. Research conducted by Pinto and her colleagues suggests that Neanderthals and early modern humans likely engaged in a dramatic cultural overlap 100,000 years in the making.
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Pinto’s story begins in her native Spain. Hot off her revolutionary research on the paleoecology of ancient cave bears, the scientist was searching for evidence of the lives and behaviors of early modern humans. Her daily expeditions took her through the rocky Cordillera Cantabrica mountain range. One day, during the routine drive to her study sites, a peculiar rock outcropping caught her eye. “I had a feeling that there was a cave in that rock,” says Pinto. “And if there was a cave, there was a chance for human occupation. I thought to myself, ‘If I were a Neanderthal or an early human, that’s where I would choose to live.’”

The outcropping had a vaulted, dominant position peering down the mountain. It overlooked the entire valley. A stream meandered near the site. Pinto says that the picturesque scene had everything an early hominid could ask for: water, plentiful food sources, shelter, and protection. It was “good real estate,” Pinto says. The spot was known locally as Sopeña, which means “under the rock” in Spanish. The limestone landmark from which the site derives its name stood sentry atop a small hill. The site tugged at Pinto’s sense of discovery.

Pinto first investigated the area in 2001. As she suspected, the outcropping housed a rock shelter at its base. At first glance, the 10-square-meter limestone enclave seemed little more than a rocky overhang. The environmental and topographic conditions would have made this shelter an ideal habitat. Just whose habitat? Pinto asked herself.

For many reasons, caves are usually better at preserving fossils than open air sites. They tend to be very stable environments, shielded from harsh weather conditions. Limestone, common in caves, helps preserve bones. Caves have their pitfalls as well. The activation and reactivation of water systems and underground rivers inside a cave can wreak havoc. Fossil evidence can be scattered or washed away. Sopeña proved to be a rare, exquisitely intact specimen.

In October 2001, Pinto began a test excavation. The technique involves digging a narrow, deep trench to gain an estimate of what lies beneath. After sifting through a meter-deep bed of manure, Pinto found an assortment of small stone tools and bone fragments. A few larger stone blades usually associated with early modern humans also were discovered.

Pinto says that a small, pointy bone tool provided even more clues. A cursory glance would reveal an unexceptional piece of debris—just one of thousands of tiny particles that litter the floor of an excavation site. But Pinto’s trained eye knew better. This object was crafted from bone, not stone. It was smooth and tapered to a sharp point. Time had worn down its patina to a dull brown, but it emanated skillful craftsmanship.

The bone point is known in archaeology as a fossil director. Such a relic is a unique indicator of the cultural tradition that produced it. Unfortunately, the base of this bone point was broken, preventing precise knowledge of when it was fashioned. Still, the bone tool was enough to allow Pinto to place the makers in the Early Upper Paleolithic Era. They lived between 35,000 and 10,000 years ago. The tool makers were among the first modern humans to populate Europe.
from direct and indirect competition to genetic mixing. The implication is that the Neanderthals were replaced by modern humans without any genetic mixing. However, some researchers believe that modern humans and Neanderthals interbred, contributing to the genetic makeup of modern humans.

During this past summer, Pinto returned to Spain to reveal more of those pages. To date, the crew has only thoroughly explored the topmost Upper Paleolithic layers. What remains to be uncovered might provide insight into the demise of Neanderthal culture and the subsequent rise of modern humans. "We can look to Sopeña to see whether there were behavioral differences in the processing of economic resources—namely, food and meat. Such differences would have given an edge to human species over Neanderthals," Pinto explains. "An example would be food preservation versus direct consumption, or the interchanging of food with other inhabitants."

The possibilities for interaction between the two species range from direct and indirect competition to genetic mixing. The implications are huge. Sopeña could figure prominently in the larger framework of human origins research, says Curtis Marean, a professor with ASU's Institute of Human Origins. "Ana has brought several valuable contributions to the Institute," says Marean, who was responsible for bringing Pinto to ASU. "We are a world leader in research on later human evolution. We plan to maintain that with research projects like Sopeña, and in South Africa. We expect it to be a very productive research angle in the near future."

Sopeña may not be as glitzy and glamorous as some other archaeological finds, but Pinto says that the glimpses it provides into early human history are invaluable. "The general public is thrilled with spectacular, single discoveries like Tutankhamen's chamber in Egypt, or the Neanderthal burial sites in France," Pinto adds. "That's not what we're about.

"Spectacular discoveries might indeed be made over the course of the excavation of Sopeña. But what we are really trying to do is reconstruct the paleoecology and human behavior that existed during the later stages of human evolution."
Pinto leans toward the “Out of Africa” theory. She suggests that cultural, climatic, and behavioral differences might have played a large role in modern humans replacing Neanderthals. However, she does not rule out the possibility of some genetic mixing.

Some scientists think that evidence left by erosion during a period when ice covered much of Europe provides a clue. They think that conditions during that period were more extreme than during earlier periods when ice covered the area.

Pinto thinks those extreme climate conditions might have had a hard impact on Neanderthals, who fed mainly on large mammals. If the numbers of their prey diminished, their chances for survival would have decreased dramatically. Modern humans may have arrived to a vastly and recently depopulated Europe. Despite that possibility, Pinto thinks it is unlikely that Neanderthals and early modern humans could have avoided each other entirely.

Also unlikely is the perception that Neanderthals were incapable of advanced technology. Some scientists believe that complex tools discovered at Neanderthal sites must have resulted from the acculturation of Neanderthals by intellectually superior modern humans. French researcher Francisco d’Errico has compiled evidence that suggests Neanderthals and modern humans created similar technology independently. D’Errico thinks that Neanderthals and humans might even have engaged in trade.

Other researchers think that the possibility of such close contact inevitably begs the question of genetic mixing between the two species. Did Neanderthal man and early modern woman (or vice versa) ever go for a proverbial roll in the cave?

Anatomically, and theoretically, the two species are similar enough that intimate relations would have been possible if they encountered one another. Recent genetic evidence seems to discount the possibility that any Neanderthal genes remain in modern humans. But the relatively small sample size leaves the question open to further research. 

Michael Price

A well-used ochre pencil found on Level III at Sopéna. Ana Pinto says that the level provided a rich haul of “symbolic” material such as ochre and quartz. Photos courtesy Ana Pinto, Ph.D.