



**Artistic vision.** Chauvet's famous Horse Panel was a carefully executed composition.

# Going Deeper Into the Grotte Chauvet

**Ten years of research have yielded detailed new insights into the stunning images considered the world's oldest cave art. But questions about their age are resurfacing**

Sometime during the last ice age, artists entered a cave in southern France, lit torches and fires, and began work on a masterpiece. Squatting on the cave floor and wielding pieces of charcoal, the artists first drew the outlines of two rhinoceroses locking horns. Then, standing up and moving to the left, they sketched the heads and upper bodies of three wild cattle. Finally, a lone artist stepped forward to execute the pièce de résistance: four horses' heads, drawn with exquisite shading and perspective in the center of the tableau, each horse displaying its own expression and personality.

This, at least, is how researchers studying the Chauvet Cave in the Ardèche region of southern France envision the creation of the famous Horse Panel. According to direct radiocarbon dating of the two rhinos and one of the cattle, they were drawn between 32,000 and 30,000 radiocarbon years ago, making them the oldest known cave art in the world. (The exact calendar age is uncertain because there is no accepted radiocarbon calibration for this period; see *Science*, 15 September 2006, p. 1560.) These early dates, announced soon after the cave's discovery in December 1994, struck a blow to conventional assumptions that such sophisticated artworks did not appear until up to 15,000 years later.

In the decade since researchers began working in the Grotte Chauvet (*Science*, 12 February 1999, p. 920), they have photographed and redrawn many of the more than 400 animals depicted, identified signs

of human activity such as footprints and hearths, deciphered the cave's geology, and analyzed thousands of bones left by cave bears that shared the cave with humans. And archaeologists have begun to propose hypotheses

about what the art might have symbolized to those who created it.

But as the team continues its work, a small but persistent group of archaeologists continues to question the age of the paintings. "Chauvet is the world's most problematically dated cave art site," says archaeologist Paul Pettitt of the University of Sheffield, U.K., whose most recent challenge was published online this month in the *Journal of Human Evolution (JHE)*. That contention—which the team vigorously rejects—has critical implications for our understanding of the origins of art. "The fundamental importance of Chauvet is to show that the capacity of *Homo sapiens* to engage in artistic expression did not go through a linear evolution over many thousands of years," says cave art expert Gilles Tosello of the University of Toulouse (UT), France. "It was there from the beginning."

## Lions, and horses, and bears, oh my!

Since resolving lawsuits and beginning scientific study a decade ago, researchers have reconstructed how the artists worked, analyzing each stroke of charcoal, red ochre, and engraving. Tosello and his wife, UT cave art expert Carole Fritz, have spent hundreds of hours perched in front of the 6-square-meter Horse Panel, photographing it in sections and drawing the artworks onto tracing paper. Working in this meticulous fashion, and noting the superposition of charcoal lines as well as slight thickenings at the beginning and end of each stroke, the pair was able to reconstruct the order and direction in which each line was drawn.

"The detailed nature of their observations is extraordinary," says archaeologist Iain Davidson of the University of New England in Armidale, Australia. Tosello and Fritz found that the artists who drew the two rhinos began with the horns and muzzles, then drew the front legs and bellies, and finally the rest of the bodies, making corrections and filling in details as they went. As the artists worked around the panel from the edges to the middle (see diagram above), they reserved a space in the center for the four horses, whose heads and necks are slightly superimposed over the backs of the cattle and arranged in a tight, diagonal orientation. This suggests to Tosello and Fritz that they were drawn by one artist. To make the horses' heads even more vivid, the artist used a tool to etch the cave wall around their muzzles so that they stand out in a prehistoric version of bas-relief.

"The entire composition is very homoge-

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