ARCHAEOLOGY

Cave Structure Boosts Neandertal Image

Ever since the first Neandertal fossils were discovered 140 years ago in Germany, the popular picture of these prehistoric humans has been one of brutish cave dwellers. But in recent years the Neandertals have won new admirers among scientists, who now credit the species with a number of advanced skills, perhaps including sophisticated speech. The view of the Neandertals' talents may brighten further with the discovery at Bruniquel, in southern France, of a deep underground cavern they apparently frequented at least 47,600 years ago, and possibly much earlier.

The cave's discoverers, who were still preparing their official announcement as *Science* went to press, note that so far it has yielded no traces of human bones or tools. But several hundred meters from the cave entrance is a complex quadrilateral structure constructed from pieces of stalactite and stalagmite. And the age of the structure, estimated from radiocarbon dating of a burned piece of bear bone found inside, puts it somewhat before the appearance of modern humans, at a time when Neandertals were Europe's sole human inhabitants.

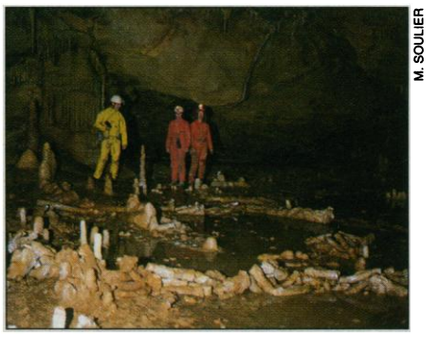
If Neandertals did build the enigmatic, 4-meter by 5-meter structure, say archaeologists, it represents a serious encroachment on a realm that had been thought to belong to modern humans, with their mastery of fire: the depths of caves. Says Yves Coppens, a paleoanthropologist at the Collège de France in Paris, "To see that people went so far inside 40,000 or more years ago, for me that is the main importance."

The cave was first discovered in 1990, when a French caver who had spent the previous 3 years enlarging a fox hole finally found the entrance. Over the past 6 years, the cave was explored by a team led by François Rouzaud, chief of the archaeology service of France's Midi-Pyrénées region; Michel Soulier, president of a local caving association; and Yves Lignereux, a professor at the national veterinary school at Toulouse who analyzed the remains of cave bears and other animals.

Because they were found so deep in the cave, there is no question that the burns on these bones are the result of human activity, says Hélène Valladas of the Center for Weak Radioactivity near Paris, who performed the radiocarbon dating. As for the date, Valladas says that her estimate of 47,600 years represents only a lower limit. "It could be much older," she told *Science*.

Either way, it is far older than the cave paintings that up to now have provided the earliest evidence of human activity deep inside caves, says Rouzaud. The oldest known cave paintings, found in the Grotte Chauvet in southern France, were recently dated at 31,000 years (*Science*, 3 February 1995, p. 614). The Bruniquel cave, he says, "shows that prehistoric men frequented the deep underground world, in total darkness, long before they began to paint on cave walls."

But they could not have done so without a sophisticated use of fire, says Randall White, a paleolithic archaeologist at New York University. "It would have been hard for them to find their way" in the total darkness, he says. "They would have needed to use fire, torches, lamps, some sort of portable light"—techniques considerably more advanced than those usually credited to Neandertals, who "have usually been considered to have had an extremely rudimentary mastery of fire," White says. Coppens adds that the discovery of such a complex artificial structure deep underground may also bear on the question of Neandertals' language abilities (*Science*, 3 April 1992, p. 33). To coordinate their work, he says, its builders would have needed to communicate.



M. SOULIER

Hidden talent. Neandertals probably built this structure, hundreds of meters down in a cave.

Rouzaud and his colleagues have contented themselves so far with studying the surface of the cavern. Now that they are sure prehistoric humans were active in the cave, however, the team plans to start digging, paying special attention to carbon deposits, which might be the remains of ancient fireplaces. Whatever they find, it is likely to enhance the reputation of the once-lowly Neandertal. "I think the Neandertal will surprise us," says Coppens. "I think he was much more clever than we thought."

–Michael Balter

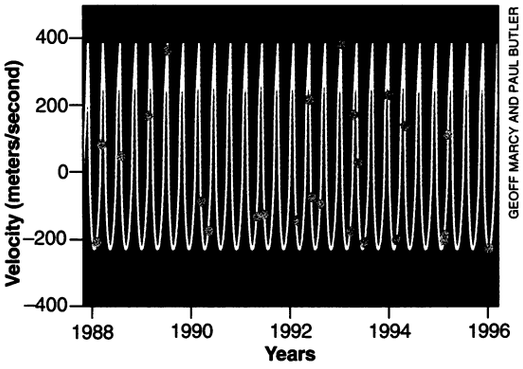
ASTRONOMY

Planets Remind Astronomers of Home

SAN ANTONIO—It isn't often that astronomers at a press conference invoke the shade of Copernicus to put a discovery in context—or that waiters in a nearby coffee shop can accurately recite the details of the find. But both kinds of accolades were heard last week at a meeting of the American Astronomical Society here. They greeted the announcement by Geoff Marcy and Paul Butler of San Francisco State University and the University of California, Berkeley, that they had detected a pair of new planets outside the solar system.

The new planets, orbiting stars in the Big Dipper and the constellation Virgo, are attracting such interest because, as Marcy puts it, they "almost smell like planets in our own solar system." Unlike the planetlike objects detected around stellar cinders called pulsars or a superheated planet practically skimming the surface of its parent star that was reported last year, the new planets have stately orbits and, in one case, comparatively mild temperatures. To Robert Brown of the Space Telescope Science Institute in Baltimore, this whiff of home from so far away "is the culmination of 500 years of intellectual history"—the gradual displacement of Earth from its unique position that began with Copernicus.

It might have come a little sooner, Marcy notes. For nearly a decade, he and Butler have been using the 3-meter telescope at the Lick Observatory of the University of California, Santa Cruz, to monitor the spectra of about 120 nearby stars. Because a star's spectrum is shifted toward blue wavelengths when it moves toward Earth and toward red ones when it moves away, such observations can reveal the wobbles caused by the gravitational tug of an invisible orbiting planet, if that planet is large enough. But Marcy says he and Butler had put off analyzing their raw spectral data because they expected that giant planets, like Jupiter, would follow very wide orbits whose signature would take more than a decade to emerge.



GEOFF MARCY AND PAUL BUTLER

Pulse of a planet. Ten years of observations reveal a wobble in the parent star, 70 Virginis.