If humans first crossed the Bering Strait 12,000 years ago, then who built the 40,000-year-old sites that are scattered from the hills of Pennsylvania to the tip of Chile?

THE FIRST AMERICANS

Just 36 miles from where glaciers once sent their icy tongues, a jagged overhang juts out from the sandstone cliffs of southwestern Pennsylvania. In this ancient rock shelter, archeologists have found evidence of human occupation many millenniums ago. A snippet from a basket or mat woven from bark has been dated at 19,600 years; charcoal hearths, stone cutting tools and deer bones lined with knife marks have been dated at about 15,000 years. The shelter, dubbed Meadowcroft, also contained tools made of rock from quarries hundreds of miles away, suggesting that the resident hunter-gatherers traded with people in what are now Ohio and West Virginia, says Meadowcroft's excavator, James Adovasio of Mercyhurst College. On the face of it, the discovery that a sophisticated culture flourished in this area as long as 19,000 years ago isn't all that startling—except that the first Americans supposedly arrived from Siberia a mere 12,000 years ago.

Determining when and how people first entered the Americas "is one of the Holy Grails of archeology," says anthropologist Brian Fagan of the University of California, Santa Barbara. It's also one of the most controversial. The quest is hampered by the antipathy of established researchers to theories other than the 60-year-old notion that man entered the New World by walking across the Bering Strait on a 50-mile land bridge 12 millenniums ago and worked his way to Central and South America in just a few centuries. Despite evidence such as Meadowcroft, and sites from Canada to Brazil dated as old as 47,000 years, that theory has refused to die. It sprouts new variations to fit new finds and is so malleable that the old school manages to twist it to fit every challenge. Some researchers say they keep quiet about finds that may undermine the dogma, for fear of being denied grant money doled out by the old school.

by **SHARON BEGLEY**

Brazil's Pedra Furada (opposite); paintings inside the shelter may be the world's earliest (top of page)

The question of origins is almost as old as Europe's awareness of the Americas. In the 16th century, scholars believed that the New World's aborigines were related to societies described in the Old Testament—the Tatars of Asia, the Scythians of southeastern Europe, the ancient Hebrews. In 1589, Jesuit missionary José de Acosta theorized that small bands of "savage hunters driven from their homelands by starvation or some other hardship" had traveled overland through Asia, reaching the New World about 2,000 years before the Spanish conquest of Mexico.

De Acosta got it half right. Evidence of blood groups and fossil teeth support the notion that the first Americans came from northeast Asia in one of the final chapters of the human diaspora. Pursuing game herds across the land bridge or seeking the Pacific's bounty in primitive boats, at some point they stayed in the New World for good. But when?

On one side of the debate are scholars of what might be called the "couldn't have" school. They argue that until about 20,000 years ago, man lacked the technological savvy to construct durable shelters, fabricate clothes of hides and fur, build fires at will and hunt in groups—all skills needed for colonizing a new continent whose climate was much harsher than today's. Says Fagan, "To settle in the Americas, humans had to be able to survive on the open tundra year-round, with subzero temperatures for months on end. They had to be technologically and behaviorally pretty sophisticated." Then there's the little matter of geohistory. A couple of dozen millenniums ago, the planet became so cold that seawater was tied up in glaciers, exposing a land bridge across the Bering Strait—but also creating glaciers in the middle of the continent which would have impeded southerly migration from Alaska. The earth did not warm, easing the way south, until about 14,000 years ago. Traditionalists also note the paucity of well-documented sites earlier than

12,000 years ago in the Americas and before 18,000 years ago in Siberia: without someone in northeast Asia to make the trek, no trek would have been made. The conservatives believe that the sharp stone spearheads found at Clovis, N.M., which are dated at 11,500 years, are the earliest unambiguous evidence of humans in the Americas.

The quick answer to the couldn't-have school is: then who made the 40,000-year-old sites, scattered from Pennsylvania to Chile? "Over the last 50 years, as many as 500 sites in North and South America have been declared to be of extreme age," says Adovasio. Among those that challenge the Clovis model:

• Bluefish Caves in the Yukon, where Jacques Cinq-Mars of the Archaeological Survey of Canada has found evidence of episodic human activity between 25,000 and 10,000 years ago. One caribou bone, which excavators believe was cut and shaped to form a tool for butchering, has a radiocarbon date of 24,800 years; a mammoth leg bone, from which flakes were chipped, is dated at 23,500 years. "We're confident that people were at Bluefish Caves by about 25,000 years ago," says archeologist Richard Morlan of the Canadian Museum of Civilization.

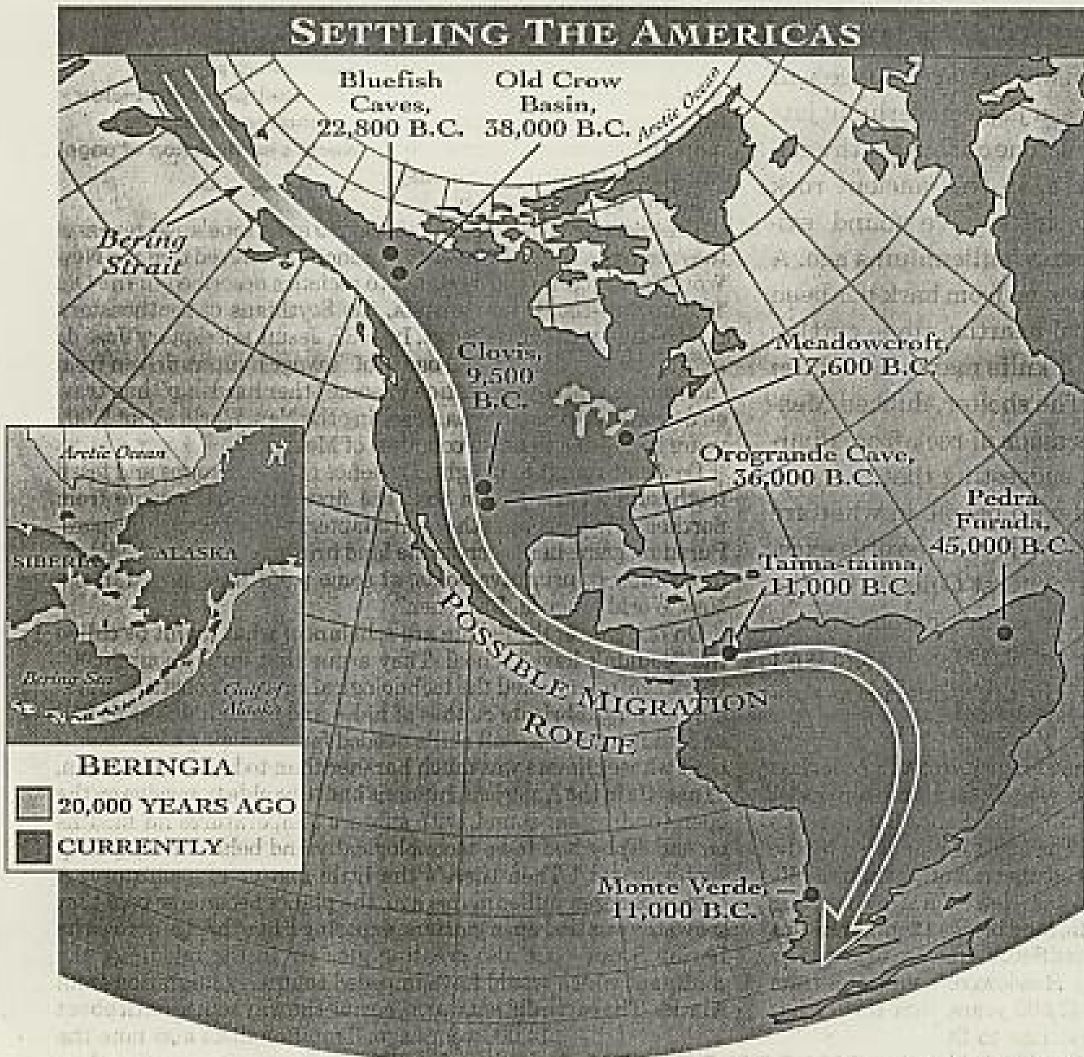
• At Old Crow Basin, 40 miles northeast of Bluefish Caves, archeologists found broken mammoth bones dated at 25,000 to 40,000 years. The dates for the bones all fall within a relatively restricted time period and show signs of being broken in the same way; this implies they were fractured by people, not by other animals or by natural forces. But many researchers doubt that humans worked the bones.

• At Orogrande cave, in southern New Mexico, archeologist Richard MacNeish announced in May that he had uncovered stones that appear to have been chipped by human hands 38,000 years ago, a 26,000-year-old toe bone of a horse with a spear point embedded in it, and a clay fireplace—with human fingerprints—dated at 28,000 years. "I think this pushes Paleo-Indians' entry into the United States back to 40,000 years," says MacNeish. The site looks like a prehistoric hunting camp for people who summered in the Sacramento Mountains and returned to the warmer basins in the autumn. Several archeologists have questioned MacNeish's interpretation.

• Taima-taima in northwest Venezuela contains the remains of a mastodon slain more than 13,000 years ago. Also unearthed: spear points and stone tools different from anything of a similar age from North America. "This suggests that people were in South America earlier than previously believed and that regional traditions had already developed by 13,000 years ago," says archeologist Ruth Gruhn of the University of Alberta at Edmonton.

• Pedra Furada in northeast Brazil is probably the most controversial site. Its discoverers, led by Niède Guidon of the Institute of Advanced Social Science Studies in Paris, claimed in 1986 that the huge rock shelter carved into the bases of immense sandstone cliffs was occupied for millenniums. The evidence: 17,000-year-old red ocher cave paintings that show birds, deer, armadillos and stick-figure people in scenes of hunting, childbirth and sex; and stone artifacts and hearths dated at 32,000 years. Last year Guidon announced even more provocative finds: an ash-filled hearth ringed with stones and dated at 47,000 years, as well as 20 other artifacts dating earlier than 14,300 years. Some scholars question whether the "human" artifacts at Pedra Furada are in fact natural, and are wary of some of the radiocarbon dates. But if the oldest date is correct, wrote Brian Fagan last year in Archaeology magazine, "then human beings were living in the New World at a time when Neanderthals flourished in Europe."

• Monte Verde, west of the Andes in south-central Chile, lies under a peat bog whose lack of oxygen inhibited decay. A team led by Tom Dillehay of the University of Kentucky has discovered an unparalleled collection of plant remains and wooden artifacts there. Among them: wooden digging sticks, mortars, spear tips and building



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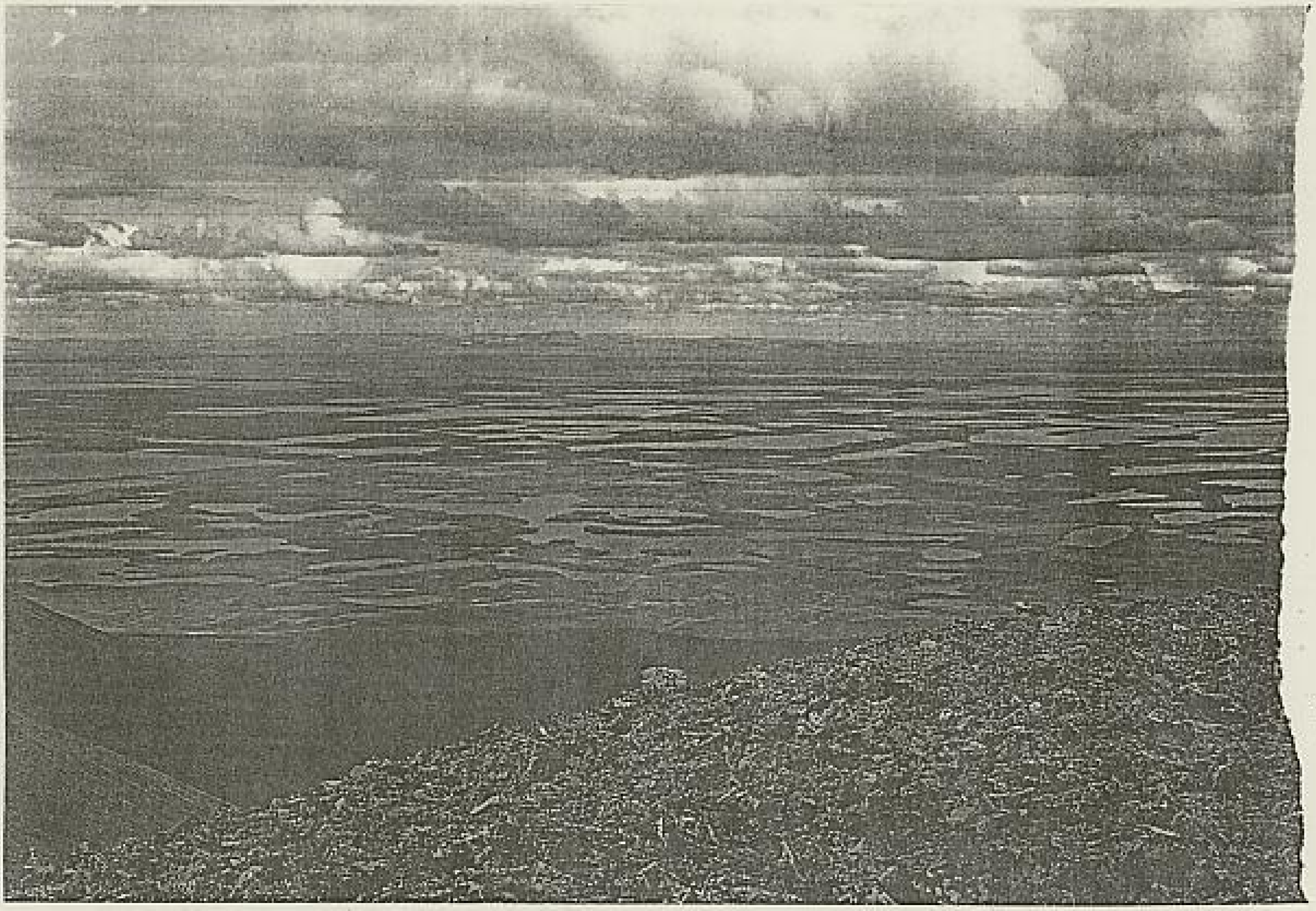


Did humans roam Old Crow Basin in the Yukon as long as 40,000 years ago?

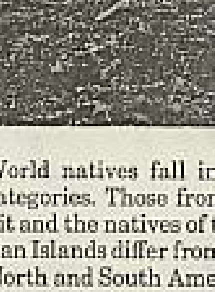
foundations, dated at 13,000 years, and remains of 65 plant species, including 15 with medicinal properties that Indians use today to treat skin diseases, colds and stomach ailments. Many of the plants come from the highlands or the coast. Either the settlers regularly trekked 60 miles to gather them or they traded with neighbors. Dillehay recently found three stone hearths and 26 pebbles that appear to have been chipped by humans as long as 33,000 years ago. But he remains cautious: "I'm the first to say that [these older dates] are inconclusive."

Whatever the date of the first migration into the Americas, there was likely more than one. Anthropologist Christy Turner of Arizona State University finds that teeth from New World natives fall into three categories. Those from the Inuit and the natives of the Aleutian Islands differ from those of North and South American Indians, which in turn differ from natives of the northwest coast and the interior of Alaska. That suggests three distinct treks, with the new arrivals following separate evolutionary paths.

Many headed south. Several scholars have assumed that the migrants, nudged by population pressure, simply expanded their territories a little bit every generation. But some archeologists are borrowing a page from Thor Heyerdahl. They surmise that people living in coastal Siberia would have been seafarers who could have not only crossed the Bering Strait but sailed on down to South America. "Even primitive boats could have traversed the entire Pacific coast of North and South America in less than 10 years," Knut Fladmark of British Columbia's Simon Fraser University suggested in Natural History magazine in 1986. Ruth Gruhn has a similar notion—"that the earliest people came along the coast," probably in kayaks and umiaks, but took as long as 20,000 years to reach Patagonia. (Humans crossed 60 miles of ocean to reach Australia from southeast Asia 40,000 years ago.) Any of their coastal settlements, however, would now be under water or eroded away by time and tide.

This maritime hypothesis may or may not resolve the debate between adherents of the traditional theory and their challengers. But if the first Americans arrived by sea, then it would not matter when the Bering Strait was bridged by land or the continental interior blocked by glaciers. And if they traveled down coastal waterways, where the climate was milder, then they might have been able to expand *Homo sapiens's* range much earlier than their technology would otherwise have permitted. If so, theirs was a truly ancient odyssey and one that calls into question the very notion of a New World.

With SUSAN MILLER



At Monte Verde, 65 plant species were preserved under a peat bog for 13,000 years