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Arrowheads Found in Texas Dial Back Arrival of Humans in America

By **JOHN NOBLE WILFORD**

For many years, scientists have thought that the first Americans came here from Asia 13,000 years ago, during the last ice age, probably by way of the Bering Strait. They were known as the Clovis people, after the town in New Mexico where their finely wrought spear points were first discovered in 1929.

But in more recent years, archaeologists have found more and more traces of even earlier people with a less refined technology inhabiting North America and spreading as far south as Chile.

And now clinching evidence in the mystery of the early peopling of America — Clovis or pre-Clovis? — for nearly all scientists appears to have turned up at a creek valley in the hill country of what is today Central Texas, 40 miles northwest of Austin.

The new findings establish that the last major human migration, into the Americas, began earlier than once thought. And the discovery could change thinking about how people got here (by coastal migrations along shores and in boats) and how they adapted to the new environment in part by making improvements in toolmaking that led eventually to the technology associated with the Clovis culture.

[Archaeologists and other scientists report in Friday's issue of the journal Science](#) that excavations show hunter-gatherers were living at the Buttermilk Creek site and making projectile points, blades, choppers and other tools from local chert for a long time, possibly as early as 15,500 years ago. More than 50 well-formed artifacts as well as hundreds of flakes and fragments of chipping debris were embedded in thick clay sediments immediately beneath typical Clovis material.

"This is the oldest credible archaeological site in North America," Michael R. Waters, leader of the discovery team, said at a news teleconference.

Dr. Waters, director of the Center for the Study of the First Americans at [Texas A&M University](#), and his colleagues concluded in the journal article that their research over the last six years “confirms the emerging view that people occupied the Americas before Clovis and provides a large artifact assemblage to explore Clovis origins.”

If the migrations began at earlier, pre-Clovis times, moreover, extensive glaciers probably closed off ice-free interior corridors for travel to the warmer south. Archaeologists said this lent credence to a fairly new idea in the speculative mix: perhaps the people came to the then really new New World by a coastal route, trooping along the shore and sometimes hugging land in small boats. This might account for the relatively swift movement of the migrants all the way to Peru and Chile.

The first of the distinctive Clovis projectile points represented advanced skills in stone technology. About a third of the way up from the base of the point, the artisans chipped out shallow grooves, called flutes, on both faces. The bifacial grooves probably permitted the points to be fastened to a wooden spear or dart.

Other archaeologists pointed out that the Buttermilk Creek dates, more than 2,000 years earlier than the Clovis chronology, are not significantly older than those for other sites challenging the Clovis-first hypothesis. In recent years, early human occupation sites have been examined coast to coast: from Oregon to Wisconsin to western Pennsylvania and from Maryland and Virginia down to South Carolina and Florida.

James M. Adovasio, an archaeologist who found what appears to be pre-Clovis material at the Pennsylvania site known as [Meadowcroft Rockshelter](#), was not involved in the Buttermilk Creek excavations but has visited the site and inspected many of the artifacts. These pre-Clovis projectile points were also bifacial but not as large and well turned as the later technology. The most striking difference was the absence of the characteristic fluting.

Dr. Adovasio, a professor at Mercyhurst College in Erie, Pa., said some of the Buttermilk Creek material resembled tools at his site and others at Cactus Hill, Va., and Miles Point, Md.

“It would appear the assemblage of artifacts is enough different from typical Clovis to be a distinct technology,” Dr. Adovasio said in an interview. “But it is not as much different as not to be ancestral to Clovis material.”

That is another likely implication of the new findings, also noted by Dr. Waters and his team. It would appear that the Clovis technology was not an Asian import; it was invented here.

No one knows exactly who these migrating people were, scientists said. Genetic studies of ancient bones and later American Indians indicate their ancestors came from northeast Asia, possibly across the Bering land bridge at a time of low sea levels during the last ice age. But it has puzzled scientists that nothing like the Clovis technology has ever been found in Siberia.

The new findings, the Waters group reported, “suggest that although the ultimate ancestors of Clovis originated from northeast Asia, important technological developments, including the invention of the Clovis fluted points, took place south of the North American continental ice sheets before 13,100 years ago from an ancestral pre-Clovis tool assemblage.”

Among other implications of the discoveries, the Texas archaeologists said, a pre-Clovis occupation of North America provided more time for people to settle in North America, colonize South America by more than 14,000 years ago, “develop the Clovis tool kit and create a base population through which Clovis technology could spread.”

The Texas archaeologists said the new dig site has produced the largest number of artifacts dating to the pre-Clovis period. The dates for the sediments bearing the stone tools were determined to range from 13,200 to 15,500 years ago.

Given the lack of sufficient organic material buried around the tools, the radiocarbon dating method was useless. Instead, earth scientists at the [University of Illinois](#), Chicago, used a newer technique known as optically stimulated luminescence. This measures light energy trapped in minerals to reveal how long ago the soil was last exposed to sunlight.

Steven L. Forman, who directed the tests, said that 49 core samples were drilled from several sections of the sediments associated with the tools. When the data were analyzed, they consistently yielded the same ages. “This was unequivocal proof of pre-Clovis,” he said at the news conference.

Other scientists examined the flood plain geology at the site and determined that the clay sediments showed virtually no sign of having been disturbed during or after the burying of the tools. Lee C. Nordt, a geology professor at [Baylor University](#), said that the traces of previous cracks in the sediment were few and too narrow to have allowed more recent artifacts from above to have settled into the deeper pre-Clovis layers.

Until recently, Dr. Waters said, archaeologists had probably overlooked earlier artifacts because the Clovis points are so distinctive and, in contrast, the pre-Clovis material has no hallmark style calling attention to itself.

“Finally, we are able to put Clovis-first behind us and move on,” he said.

A few scientists, even among those who endorse the presence in the Americas, said they had some reservations about aspects of excavation methods at the Texas site. One who did not want to be quoted or identified questioned whether the reported artifacts justified such a fanfare. He considered the whole issue settled years ago when a panel of experts judged that the Monte Verde site in southern Chile was indeed pre-Clovis.

Dr. Adovasio noted that the Clovis model had been “dying a slow death.” He recalled that “Waters himself was a Clovis-firster, but changed years ago.” At a conference in 1999, the conventional hypothesis seemed to be on its last legs after a review of the Monte Verde data; still a few holdouts stood fast in opposition.

“The last spear carriers will die without changing their minds,” Dr. Adovasio said.