The First Americans Are Getting Younger

In recent years anthropological opinion has been shifting in favor of a relatively recent date (not much more than 11,500 years ago) for the first human colonization of the Americas

"EXPERT opinions on the earliest secure archeological sites in the New World are astonishingly diverse," notes Donald Grayson of the University of Washington. "There is the new site of Toca de Esperanca in Brazil at 300,000 years; there is Calico at 200,000 years; there is Meadowcroft at 16,000 years; there is Monte Verde at 13,000 years; then there are the undoubted Clovis sites with their camels, elephants, tapirs, and fluted points at 11,500 years ago."

Grayson was speaking at a recent symposium, titled "Americans before Columbus,"* at which participants specifically addressed the question: When did humans first colonize the Americas? In fact, as Grayson implies, the question really asks: Were the Clovis people the first Americans? Or were there pre-Clovis settlers?

There are many well-dated archeological sites containing the so-called fluted projectile points that are so characteristic of the Clovis culture, which existed throughout North America from 11,500 to 11,000 years ago. No one doubts, therefore, that the Americas were peopled by this time. The uncertainties pertain to the scores of sites with ages said to be older than 11,500 years. "All the earlier sites are controversial to some degree," notes Richard Morlan of the Canadian Museum of Civilization Ottawa, after completing a survey of the evidence from 70 such sites. He concludes that "archeologists are faced with no easy task in their search for the first colonists of the Western Hemisphere."

During the past decade anthropological opinion has been shifting in favor of the Clovis people truly being the first Americans, a sentiment that was pressed further at the recent symposium. This shift has been the result partly of the recent collapse of certain highly visible counter claims. But more important has been a more clear-cut definition of Clovis times through better dating, and the more rigid application of criteria by which archeological sites should be judged.

"What does it take, then, to show that a site is really old?" asks Grayson. "The criteria are easy to list: the site has to have undoubted artifacts or human bones; those human relics have to be in an undisturbed deposit; the associated dates have to be secure beyond a reasonable doubt; and the whole has to be excavated and published in such a way that other scholars can address whether or not these criteria have been met."

Clovis sites meet these criteria, as do those of the Folsom people, who followed immediately after Clovis and quickly expanded to the southernmost tip of South America. "Archeologists have been involved in debates over [ancient] human presences before," observes Grayson, "and in every instance the debates were ultimately solved not because hard-nosed objectors abandoned the criteria which they used to reject sites, but instead because equally hard-nosed investigators found sites that met those criteria."

So far, all putative pre-Clovis sites have failed to convince the "hard-nosed objectors" that humans entered the Americas much before 11,500 years ago. One site, however, comes close: specifically, the Meadowcroft Rockshelter near Pittsburgh, which might have been occupied as much as 19,600 years ago.

First, however, the background to the peopling of the Americas, a subject that has intrigued scholars ever since the European arrival five centuries ago. Thomas Jefferson was interested in the problem, and deduced from his archeological and linguistic work in the 1780s that American Indians and northern Asiatics had a common origin.

The migration route from the Old World to the New was across the 100-meter-long Bering land bridge, which is exposed as dry land with a sea-level drop of just 50 meters. Mammoth, mastodon, bison, saber-toothed tigers, short-faced bears, dire wolves, cheetahs—these and many more Old World species had made the crossing at various times during the Pleistocene (2 million to 10,000 years ago).

For modern humans, the window of opportunity for crossing Beringia opened some time between 75,000 and 11,000 years ago, the period of the last glaciation, during which time sea level fell substantially.

*"The Americans before Columbus: Ice age origins," held at the Smithsonian Institution, Washington, D.C., 26 September.

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A Sioux woman

A descendant of the Asiatic people who migrated to the New World a little more than 11,500 years ago, this woman spoke one of the 1,000 languages that existed in the Americas at the time of the arrival of Columbus (see box).

The intensity of the glaciation pulsated through that time, with maxima at about 65,000 and 18,000 years ago, producing a fall of 100 meters or more in sea level at these times. But even during less frigid periods, Beringia was probably exposed to some degree, or severed only by a narrow seaway that would have been easily crossable on winter ice.

However, even though the window might have been open in various degrees throughout the last glaciation, humans do not appear to have been in a position to exploit it until about 25,000 years ago. This date is when the first archeological signs of human presence occur in northeastern Asia, the Old World threshold to Beringia. Of course, the current absence of earlier evidence does not necessarily demonstrate that there is none.

Once across Beringia, migrants faced yet another potential barrier to the way south. Giant ice sheets mantled much of the northern reaches of North America, the Laurentide sheet over the east and center, the Cordilleran sheet to the west, both of which measured as much as 2500 meters in thickness. As the University of Washington's Stephen Porter explained at the recent symposium, geologists still debate whether and for how long the two sheets might have fused as one, thus shutting down a potential ice-free corridor joining Alaska, the Yukon, and the Northwest Territories with the Central Plains.

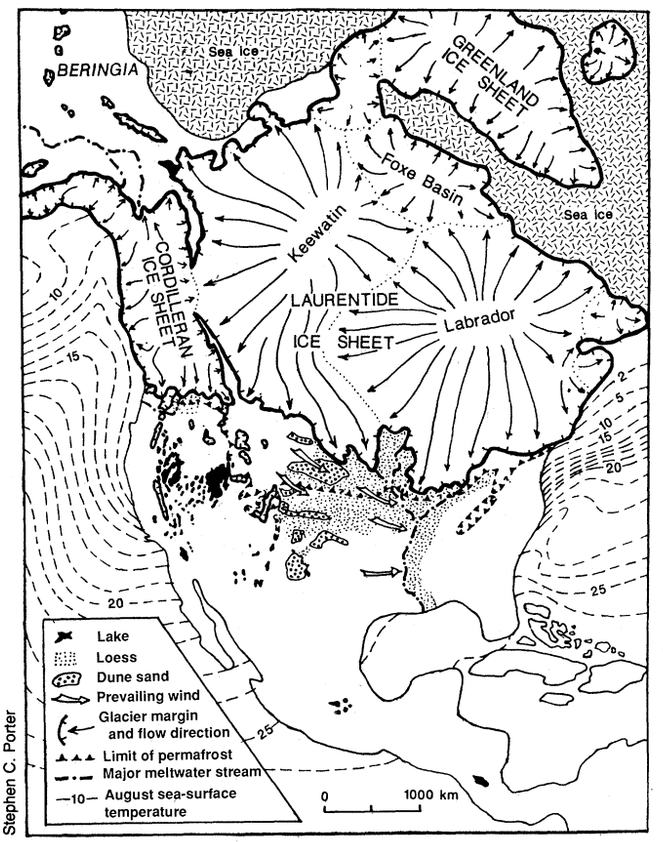
Although the overall conformation of the two ice sheets fluctuated throughout the glaciation, the most likely time of confluence was at the glacial maximum, around 18,000 years ago. However, notes Porter, even when the ice-free corridor existed, it might have presented an invisible barrier to migration, conditions within it being so harsh as to make it biologically sterile.

When the ice age eventually ended, which it did dramatically yet fitfully between 12,000 and 9,000 years ago, the continent was plunged into a "dynamic change in climate and geology, the like of which has not been experienced since," says Porter. "Different tree types migrated from widely separated refugia of full-glacial times at different rates and in different directions. The result was the development of floras that would appear ecologically anomalous today." And 90% of the large mammal species had become extinct—some 70 species in all.

So, if humans had arrived in the Americas, say, 25,000 years ago and made their way south of the ice, they would have coexisted for 15 millennia with an ice age world that was unlike anything we know today. Then, as the ice age ended in geological, climatological, and biological turmoil, the Clovis culture would have become established and the previously sparse human population exploded. The alternative explanation is that the arrival of the Clovis people coincided with the end of the ice age.

Ice age Americas

The last galciation peaked at 18,000 years ago, reducing sea levels by as much as 100 meters, clearly exposing the Bering land bridge. In addition, the two great ice sheets that mantled much of northern North America probably coalesced, closing off the ice-free corridor that joined Alaska and the Canadian Northwest Territories with the Central Plains.



Some scholars, most notably Paul Martin of the University of Arizona, argue that the Clovis people were not just witnesses to the biological turmoil of the time—specifically, the widespread extinction of large mammal species—but in fact caused part of it. Martin's "overkill hypothesis" has been promoted for some time now, and is countered by scholars such as Ernest Lundelius of the University of Texas, who finger environmental change as the culprit.

Examples of both phenomena are known from the prehistoric record, but the question of which was most important in the Americas remains unresolved. Grayson points out, however, that for the 70 species of large mammal that are assumed to have become extinct precisely at the end of the ice age, securely dated corroborative fossil evidence exists for only seven of them. It is possible, he suggests, that others became extinct before the Clovis population explosion, which would argue against the overkill hypothesis.

It is true that Clovis people must have on occasion successfully hunted large mammals, such as mammoth and mastodon, because their fluted projectile points are often found associated with the remains of such beasts, at least in western North America. But, warns Grayson, "there is good reason to think that we may have a greatly exaggerated impression of the importance of large mammals in [Clovis people's] daily life." The reason is that many Clovis sites are discovered only after the detection of large bones, usually partially buried. "As a result, if Clovis people in the west spent most of their time hunting mice and gathering berries, we probably would not know it."

When Morlan began his survey of putative evidence for pre-Clovis occupation he was responding to the recent claim by one authority that "there are numerous, well-documented sites which predate the acceptable early limits set by archeological orthodoxy." The first conclusion Morlan reached after scrutinizing some 70 sites was that this simply was not the case. "There are five sites that suggest we should exercise caution in adopting that orthodoxy," he says.

One of these is Bluefish caves, in northern Yukon Territory, which would have been north of the ice. With bone artifacts dated to as much as 24,800 years, this site persuades Morlan that people were probably present north of the ice long before Clovis times, and would therefore have been in a position to move south, through the ice-free corridor. What is the evidence that they did?

Three sites in South America—Los Toldos Cave in Argentia, Tagua-Tagua in

Chile, and Taima-Taima in Venezuela—bear close examination, but none of them is thought to be more than 13,000 years old. Nevertheless, Morlan reserves judgment, through doubts about dating in some cases and questions of the authenticity of the site in another. The Meadowcroft Rockshelter stands out as the best claimant.

"Meadowcroft is the most intensively studied, most extensively published upon, and most thoroughly dated of all putative pre-Clovis sites known in the Americas," says James Adovasio, the site's principal researcher. In addition to animal bones, the deposits at Meadowcroft contain undoubted stone artifacts, and even a piece of woven basketry. Most persuasive is a series of eight radiocarbon dates from the bottom of the living floors to the top, going from 19,600 to 12,800 years.

Although impressed by Meadowcroft, Morlan is concerned about aspects of preservation in some of the lower layers. In addition, he notes "it seems surprising that Meadowcroft would yield oak charcoal and walnut shells in levels dated to 15,000 and 16,000 years ago." At this time the Laurentide ice sheet would have been just 80 kilometers to the north, so that stands of oak and walnut trees would not be expected to have flourished in these conditions. Vance Haynes of the University of Arizona makes the same point.

A vigorous critic of pre-Clovis claims, Haynes also wonders whether contamination from coal deposits might have distorted the radiocarbon dating results. Unlikely, counters Adovasio, who says that contamination would surely have disrupted the more or less perfect sequence of older to younger dates from the lower deposits to the top. And so it goes.

If Meadowcroft indeed is an authentic, pre-Clovis site, then it is extremely important in American prehistory. Equally significant is that, at present, it appears to be the only site substantially older than Clovis times. The question then is, if people were living south of the ice 8000 years before Clovis times, why did they not undergo a population explosion such as happened with the Clovis and the Folsom people? Martin and others find this a persuasive argument in itself against *any* pre-Clovis occupation. But it may be that conditions were simply not conducive to rapid population growth at the height of the ice age.

As Grayson notes, the bare facts that are accepted—Clovis occupation by 11,500 years, coinciding with the extinction of seven species of large mammals, and possibly with many more—"leave an extraordinary amount of room for clarification in the future." ■ **ROGER LEWIN**

Speaking in Many Tongues

When Columbus landed in the Americas, some 1000 different native languages were being spoken in the New World, about 600 of which survive to this day. By comparing basic vocabularies and tracing words that are similar in sound and meaning, it is possible to reconstruct the evolutionary history of these multitude of tongues, leading finally to their origin(s). Joseph Greenberg of Stanford University has done this, and concludes that American Indian languages fall into three groups—Amerind, Na-Dene, and Aleut-Eskimo. "We have hypothesized that the three linguistic stocks represent separate migrations," he notes. "They differ greatly, and there is little likelihood that they are branches of a single linguistic stock."

Greenberg's conclusion is challenged by some scholars, who argue that there are as many as 200 independent linguistic stocks in the Americas. "If this claim is accepted," notes Greenberg, "two alternative nonlinguistic historical conclusions are possible. One is that each of these represents a separate migration, thus requiring a traffic controller at the Bering Strait. The other is that there are relatively few migrations or even a single one but that the time elapsed is so vast that all traces of affinity among any of the groups have been effaced."

Greenberg first advanced his hypothesis in outline more than three decades ago, and has since amassed volumes of data that, he says, support it. The core of these data are lists of words for pronouns and parts of the body, words that tend to be rather stable through time and therefore give an insight into relationships between languages. For instance, just as the Indo-European languages are characterized by the first-person *m* and second-person *t*, the equivalents in Amerind languages are *n* and *m*. This analysis, says Greenberg, not only reveals the three independent linguistic groups already identified, but also gives some indication of their history.

Amerind is the oldest language of the three, he says, "since it centers further south than the others and shows greater internal differentiation." In fact, there are some 11 subgroups of Amerind, which are found throughout South America and much of North America. Next is Na-Dene, which is spoken mainly in the Northwest, with a pocket also in the Southwest. Last is Aleut-Eskimo, which clings to the northern peripheries of the continent.

This linguistic division into three groups does not necessarily prove that the Americas were the object of three separate migrations, notes Merritt Ruhlen, an independent scholar in Palo Alto. "A single migration, with subsequent differentation into three families in the New World, is a logical possibility," he says. "At most we can conclude that there were not more than three." Nevertheless, there is evidence of three discrete migrations, argues Ruhlen, "in that each of the three New World families appears to be more closely related to language families in the Old World than to either of the other two New World families."

According to Greenberg, Aleut-Eskimo is most closely related to a group of languages he calls Euroasiatic, which includes the Indo-European, Uralic, Altaic, Ainu, Gilyak, Japanese, and Korean languages. Na-Dene appears to be closely linked to a different set of Old World languages, which includes Sino-Tibetan, North Caucasian, and Basque. Amerind is again difficult to pin down, but may have affinities with languages families in Africa, Europe, Asia, Australia, and Oceania. As far as genetic data go at the moment, there appears to be some support for these roots.

Linguists occasionally attempt to infer the length of separation of two related languages, by measuring the degree of difference between some of the important, stable words. Known as glottochronology, the technique assumes a rather steady rate of change with time, just as some molecular biologists take accumulated mutations as a molecular clock. Greenberg acknowledges certain shortcomings with the technique, but cites work on the three New World language groups. Divergence dates for the Aleut-Eskimo group vary a little, but center on about 4000 years ago. Na-Dene goes back further, with divergence in the group pointing to 9000 years ago. Amerind proves to be most difficult of all, "with a time period probably greater than 11,000 years and beyond the limits of glottochronology." ■ **R.L.**

ADDITIONAL READING

J. H. Greenberg *et al.*, "The settlement of the Americas," *Curr. Anthrop.* **27**, 477 (1986).
M. Ruhlen, "Voices from the past," *Nat. Hist.*, **96**, 6 (March 1987).