Flakes, Breaks and the First Americans

Flaked stones and broken animal bones are part of a controversial challenge to the notion that humans did not migrate to North America until the end of the Ice Age

By BRUCE BOWER

To many archaeologists, the contention that humans first trooped into North America 200,000 years ago or more is outrageous at worst, an interesting but unproven assumption at best. But evidence for this controversial view from two archaeological sites – one located just east of the Calico Mountains in southern California's Mojave Desert, the other straddling the Old Crow River in Canada's Yukon Territory – is, after more than two decades, undergoing a rigorous analysis that is sure to stoke up further debate over when the first Americans arrived.

"In my opinion, we're at a critical turning point," says archaeologist Alan L. Bryan of the University of Alberta in Edmonton, Canada. "We no longer have any logical basis for proclaiming an arbitrary limit beyond which people could not have entered America."

For the last half century, that limit has generally been agreed to be about 12,000 years ago, or 2,000 years before the end of the Ice Age. Radiocarbon dates of stone spear or arrowhead points found near Clovis and Folsom, N.M., in the 1920s laid the foundation for this view. Some of the stones, carefully flaked on both sides to form sharp edges, were found among the bones of mammoth and extinct bison. It appeared that hunters with advanced methods of tool-making had migrated from Siberia to North America across a land bridge where the Bering Straits are now located and rapidly filtered southward in their search for big game.

It is becoming increasingly clear, however, that there were earlier settlers whose way of life was a far cry from big-game hunting on the High Plains, says Bryan. Human occupation at two South American sites was recently shown to extend back at least 33,000 years (SN:6/28/86,p.405). Since migration via the Bering land bridge is, he contends, the most plausible route for the first immigrants, there must be earlier human occupation sites in North America. His view is supported by the 19,600-year-old radiocarbon date for a braided fragment, apparently a remnant of a woven basket or mat, found at the Meadowcroft Rockshelter near Pittsburgh.

Furthermore, explains Bryan, the majority of early Americans may have been hunter-gatherers who used simple (not necessarily human-made) stone flakes, broken animal bones and wood implements to obtain and prepare food. Artifacts such as these do not preserve well and are often difficult to recognize as tools if they survive the millennia. Waterlogging of the 13,000-year-old Monte Verde village site in Chile protected an abundance of these simple tools and demonstrates that the inhabitants were foragers, not predatory hunters with sophisticated stone weapons.

Indians whose hunting tools were found at Clovis and Folsom had "one of the most highly specialized ways of making a living that developed anywhere in the Americas," says Bryan. The forests surrounding Monte Verde, on the other hand, were a bountiful source of perishable materials such as bone and wood that could be used in gathering and preparing various foods, including the occasional kill of a large animal.

If perishable bone and wood tools were once used at the arid Calico Mountains site in California, they did not have the benefit of a protective liquid bath. Yet thousands of flaked stones excavated from several pits appear to have been modified by humans and, according to a preliminary analysis in a book edited by Bryan *(New Evidence for the Pleistocene Peopling of the Americas*, Center for the Study of Early Man, University of Maine, 1986), some of the stones are from a layer of earth that is at least 200,000 years old. A more extensive examination of the Calico stones will appear later this year in the JOURNAL OF FIELD ARCHAEOLOGY.

"Early man appears to have crossed over to North America in the mid-Pleistocene and to have used a variety of simple stone tools," says archaeologist and Calico project director Ruth D. Simpson of the San Bernardino County Museum in Redlands, Calif. The Pleistocene epoch stretched from 1.6 million to 10,000 years ago.

It is difficult to tell if the new reports out of Calico will meet with the approval of skeptical archaeologists. In the past, some of the stones have been described by Calico investigators as human-produced tools when, to many outside observers, they appeared to have been shaped by natural forces.

Another concern with the site, says Dennis J. Stanford of the Smithsonian Institution in Washington, D.C., is the lack of additional signs of human occupation, such as hearths. Several stone arrangments resembling hearths have been

Unmasking the marsh people

Ancient fossilized bones of human ancestors have been dug up in Africa, Asia and Europe, but not in the Americas, point out skeptical archaeologists who reject claims that people inhabited North America for hundreds of thousands of years. The problem, responds archaeologist Emma Lou Davis of the Great Basin Foundation in San Diego, is not that the search is in vain, but that "we have been looking in the wrong places with the wrong methods."

She proposes that the earliest Americans were "people of the marshes" drawn to lake valleys that, in some cases, have since dried up. California's Mojave Desert contains a number of these sites, she writes in *New Evidence for the Pleistocene Peopling of the Americas.* Early migrants to North America could have used marshy bogs surrounding the lakes as food sources and traps for large animals, while setting up camp on nearby ridges that overlooked the entire vicinity.

Archaeologists must use aerial photography and careful ground surveys to locate parched Pleistocene lake valleys, says Davis. Then bulldozers can dig trenches into neighboring ridges so the underlying geological layers of sediment can be probed. "The evidence should be massive," she notes.

– B. Bower

uncovered at Calico, but, according to a recent study directed by Janet L. Boley of the California Institute of Technology in Pasadena, five stones from a proposed "fireplace" display none of the magnetic changes associated with having once been heated. "The hearth, as well as the [entire] Calico site, remains highly controversial," says Boley.

Adds archaeologist Richard E. Morlan of the National Museum of Man in Ottawa, "I've seen no solid evidence for human occupation at the Calico site. [Soil movement and erosion] could have produced all sorts of artificial artifacts."

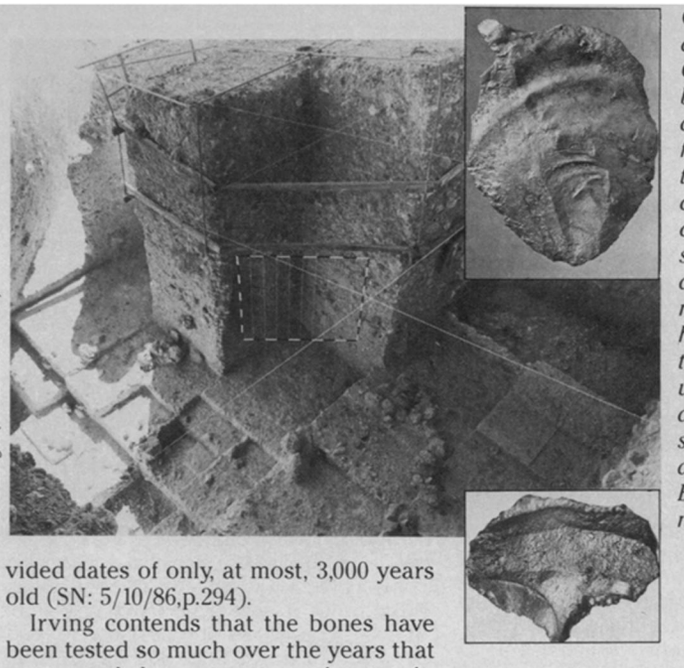
Ancient mud flows at the east end of the Calico Mountains played a major role in moving earth and breaking up rocks where Simpson and her colleagues (who in the early years included the now-deceased fossil hunter Louis Leakey) have been digging since 1964. But they contend that the geological changes left a deposit of rocks well suited to tool production. Almost 4,000 flakes with signs of human alteration, such as sharp edges bordered by bumps or "bulbs" that are created when flakes are worked out of stone, have been identified in two large pits. About 300 are considered by the investigators to be prime examples of simple tools flaked on one side, such as blades, scrapers and choppers. The collection makes up what they call "a complete early man tool kit."

It is unlikely the stones were fractured by soil erosion or other natural forces, says Simpson. Besides their distinctive surface markings, the specimens are grouped together rather than scattered throughout the site and include delicate flakes that would not have survived major earth movements.

Two periods of human occupation have been dated at Calico. From about 15,000 to 20,000 years ago the area was inhabited by what Simpson suggests was a hunting-gathering people with more sophisticated tools, including stones flaked on both sides. In deeper layers estimated to be at least 200,000 years old are the simpler flakes of people, she says, who probably gathered plants and other foods.

The earlier date was obtained through calculations based on the rate of decay of uranium and thorium in the soil, a technique Bryan says is uncertain and should be repeated to verify the estimate. Many archaeologists, including Bryan's colleague Ruth Gruhn, do not think the 200,000-year-old date will pan out.

Farther to the north, there have also been questions about the age of four bone tools recovered along the Old Crow River in the Yukon Territory. Radiocarbon dates for the tools, found in 1966 by William N. Irving of the University of Toronto and his colleagues, were originally around 30,000 years old. But carbon from the center of the bones that is less susceptible to contamination provided dates of only, at most, 3,000 years old (SN: 5/10/86,p.294).



Fred Budinger (Insets: Dan Griffin)

One of the two pits at the Calico site in California that have been excavated to depths of up to 26 feet. Stone flake, top inset, was found at a depth of 11 feet and bears a "bulb scar" or ridge indicating it was manufactured by humans. A graver that was probably used for cutting or digging, bottom inset, was found at a depth of 19 feet. Both artifacts are made of chert.

Irving contends that the bones have been tested so much over the years that not enough bone mass remains to pin down conclusive dates. More importantly, he says, discoveries during the last five field seasons have uncovered an "Old Crow bone industry" of extremely great age — 100,000 years or more.

Nearly 200,000 vertebrate fossils and up to 10,000 horse and mammoth bone artifacts have been found along the Old Crow River since 1966. Soil erosion in the slopes bordering the river caused some bones to tumble to its bank, where investigators picked them up; other bones were dug out of the slopes at a number of locations. In Bryan's volume and in the February NATURAL HISTORY, Irving reports that some of the bones are broken and flaked in systematic ways, probably through the use of stone hammers and scrapers. For example, 13 percent of the mammoth long bones recovered so far exhibit "spiral" fractures that occur when bones are broken while still fresh.

"We are confident in attributing these fractures to humans, even where no particular function or use is apparent," says Irving. "Neither large carnivores, such as bears, nor drifting river ice have ever been observed to cause such fractures."

The Old Crow River has cut as much as 110 feet down through the basin sediments, giving scientists access to extremely old layers of soil and clay. Five mammoth bone flakes unearthed 30 feet below the basin floor have been radiocarbon dated at 22,000 to 43,000 years old.

Over the last few years, notes Irving, fractured bones bearing the signs of human alteration have been found in deposits 60 to 70 feet below the basin floor. The depth of these finds, as well as the presence of bones belonging to extinct kinds of lemmings and other animals in the same layers of earth, indicates that they are at least 100,000 years old, he maintains. The bones were redeposited at some point, acknowledges Irving, creating uncertainty in pinning down their age. But he adds that little and big fragments are concentrated together, suggesting that the bones were not moved far enough to discredit his minimum age estimate.

The bulk of the discoveries at Old Crow has, so far, been relegated to bone. Only about 50 stone artifacts that could have been used to break and flake animal bones have been found along the river. Although the frozen Yukon soil preserves wood well, not a single wooden implement has been identified. "We may not even know what wood artifacts from 100,000 years ago look like," says Irving.

At other sites along the Old Crow River, Richard E. Morlan has recovered seven mammoth bones with the fractures and flakes typical of human alteration. Radiocarbon dates for the bones range from 25,000 to 40,000 years ago. "I've found no indication that people were present before then," says Morlan. The much earlier estimates of Irving, he adds, are not yet conclusive.

Bryan also takes a cautious view of the Old Crow dates, particularly because soil movement along the river may have had a greater effect on the remains than Irving has estimated. But from the wintry Yukon to the Calico Mountains to the forests of South America, he asserts that the key evidence for early human occupation consists of simple stone flakes and broken animal bones associated with "occupation debris" such as hearths. The widely accepted claim that humans inhabited Australia 40,000 years ago is grounded on clues of this type.

Yet Clovis-style stones remain the seal of approval for human occupation sites in the Americas. "If Monte Verde had been excavated first," says Bryan, "we'd have a whole different conception of how to look for early man." □