



# MAMMOTH TRUMPET

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Center for the Study of the First Americans  
Department of Anthropology, Texas A&M University  
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College Station, TX 77843-4352  
<http://centerfirstamericans.org>

## Footloose in Siberia 18,000 years ago



Russian archaeologists, brothers Mikhail and Aleksander Konstantinov, first began excavating Studenoe 2 in 1975. This photo shows how the site, which is hard against the Mongolian border, looked in 1996 when Western scientists were first allowed entry to localities in the former USSR. Today it amazes a team of American Investigators, Ted Goebel of the University of Nevada, Reno, and Ian Buvit and Karlsa Terry of Washington State University, because of its extraordinary state of preservation—"the Pompeii of southern Siberia," Buvit calls it. Artifacts, including bone needles and even beads made of ostrich shell, have survived over the millennia. So have the cobbles you see in the photo, remnants of temporary shelters these nomadic people erected before moving on. Our story about this remarkable site begins on **page 9**.

**T**he Center for the Study of the First Americans fosters research and public interest in the Peopling of the Americas. The **Center**, an integral part of the Department of Anthropology at **Texas A&M University**, promotes interdisciplinary scholarly dialogue among physical, geological, biological and social scientists. The **Mammoth Trumpet**, news magazine of the **Center**, seeks to involve you in the peopling of the Americas by reporting on developments in all pertinent areas of knowledge.

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## The Denver Museum of Nature & Science

### Early-Paleoindian Research

ALL PHOTOS: DENVER MUSEUM OF NATURE & SCIENCE

Steven R. Holen, Curator of Archaeology

**T**HE STUDY of the earliest human occupation of North America is a key element of the history of the Denver Museum of Nature & Science (DMNS), known as the Colorado Museum of Natural History (CMNH) from 1900 to 1948, and the Denver Museum of Natural History (DMNH) from

1948 to 2000. Research on early-Paleoindian sites started when Jesse Figgins was director of the Museum (1910–1936).

In the early 1900s, most archaeologists in North America believed that humans did not arrive in North America during the last glacial period but instead were more recent immigrants, possibly arriving only 3,000 to 4,000 years ago. This conservative view was

advocated by the most influential scientists of the time, archaeologist William H. Holmes and physical anthropologist Aleš Hrdlička, both of the Smithsonian Institution. A few archaeologists and several paleontologists, however, thought that humans had arrived much earlier, during or before the last glacial period when now-

## INSIDE

### 4 Where future scientists learn by doing

Master flintknapper and potter (and proponent of the Solutrean migration theory) Bruce Bradley passes on his skills in his master's class on Experimental Archaeology.

### 6 Undoing decades of neglect

The moribund Clovis-first theory no longer overshadows discoveries in the southern continent. Ruth Gruhn says it's time we paid attention to evidence of South American Paleoamericans.

### 9 Swift nomads in early Siberia

Whether or not they were ancestors of the First Americans, they left a wonderfully preserved record of their existence.

### 14 On the lifestyle of early coastal South Americans

The conclusion of our series on maritime peoples—how they lived, worked, and traveled.

extinct animals like mammoths, mastodons, camels, and sloths roamed the landscape. Jesse Figgins was among this latter group.

### The Jesse Figgins Era, 1910–1936

Jesse Figgins did not have formal university degrees but had worked at the American Museum of Natural History, primarily in the exhibits department. He also had served on scientific field parties. Figgins developed a very active paleontological program at the Denver Museum after his arrival in 1910 and soon became interested in archaeology.

**Lone Wolf Creek site** In 1924, a paleontological crew from CMNH excavated bones from an extinct form of large bison near Colorado City, Texas. The bones, buried 7 ft deep in a cemented mixture of sand, gravel, and silt, were cast with the attached matrix. Although three spear points were found associated with the bison bones when the undersides of the casts were being prepared in the field, the scientific community did not accept this discovery as evidence of an early human occupation of North America because the points were removed from context before they were properly documented. The viewpoint of Smithsonian scientists therefore still held sway. Figgins nonetheless was not dissuaded and continued work on these early bison sites.

**The Folsom site** George McJunkin, a self-educated black cowboy, discovered the Folsom site in a ravine near Folsom, New Mexico, in 1908 and attempted to elicit professional interest in the site until his death in 1922. In 1926, Jesse Figgins sent a paleontological crew from CMNH to excavate the large bison bones—taking care to direct the crew not to disturb any spear points associated with the bones. That year the tips of two Folsom points were found with bison bones but not in place. When the excavation was continued in 1927, another four spear points were found but, again, not in place. Finally a point was found indisputably in situ. Figgins called in three famous scientists, Frank H. H. Roberts, archaeologist from the Smithsonian; Barnum Brown of the American Museum of Natural History; and A. V. Kidder, archaeologist from Phillips Academy. All three scientists accepted as

valid the association of the point with the bones. In 1928, a joint excavation between CMNH and the American Museum of Natural History also found spear points associated with large bison bones. Telegrams were again sent out, and many scientists came to see the artifacts in place with the bison bones.

Figgins named the new spear point type Folsom after the nearby town of that name. This discovery, which demonstrated that humans were present at the end of the last glacial period, initiated a

major shift in archaeological interpretation. The discovery is the most famous made by Museum scientists and one of the most important discoveries in the history of North American archaeology.

### E. B. Renaud's Paleoindian Research

The first professional archaeological field research was conducted for the Museum by Étienne B. Renaud, a French archaeologist working for the University of Denver. In 1929, CMNH financed an archaeological survey of Dry Cimarron Valley in



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Many years may pass between the time an important discovery is made and the acceptance of research results by the scientific community. To facilitate communication among all parties interested in staying abreast of breaking news in First Americans studies, the **Mammoth Trumpet**, a science news magazine, provides a forum for reporting and discussing new and potentially controversial information important to understanding the peopling of the Americas. We encourage submission of articles to the Managing Editor and letters to the Editor. Views published in the **Mammoth Trumpet** are the views of contributors, and do not reflect the views of the editor or Center personnel.

—Michael R. Waters, Director

northeast New Mexico and into Oklahoma in the area east of the Folsom site to look for evidence of "Folsom man." Renaud did not find any additional evidence of Folsom culture, but he laid the framework for a much wider search for evidence of early cultures.

In 1930, Renaud began the Archaeo-

rily with the discovery and documentation of "Yuma" and Folsom sites. The areas surveyed with CMNH support included eastern Colorado in 1930 and northeast Colorado and eastern Wyoming in 1931. Renaud began to define various Paleoindian projectile point types in two important articles published

**Dent site** The Dent site was discovered in 1932 by a railroad workman, Albert Garner, along the margin of the South Platte River near Dent southwest of Greeley, Colorado, after a heavy rain caused erosion along the railroad. Garner contacted Father Conrad Bilgery of Regis College, who began excavation of

a mammoth bone bed with the help of his students. They discovered and removed a fluted spear point associated with the mammoth remains. Fr. Bilgery recognized the importance of the find and turned the excavation over to Jesse Figgins and CMNH. During additional excavations in 1933 they discovered and photographed a fluted spear point in the mammoth bone bed. Figgins in 1933 published "A Further Contribution to the Antiquity of Man in America" in *Proceedings of the Colorado Museum of Natural History*. This find represents the first professional discovery, documentation, and publication of the association of a fluted spear point with mammoths in North America. The Dent site represented the second major discovery of early human artifacts by the museum in seven years and placed CMNH at the forefront of the study of early humans in North America. Figgins correctly suggested that Folsom artifacts are older than Yuma artifacts and speculated that humans entered North America before the last glaciation.

**The Lindenmeier site** E. B. Renaud brought the archaeological community's attention to the Lindenmeier site, near Ft. Collins, Colorado, when in 1932 he described Folsom points from the site. In 1935 the Smithsonian Institution

and CMNH conducted excavations at the site. Figgins hired John Cotter, Renaud's graduate student at the University of Denver, to lead the CMNH

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## Milestones in Western Archaeology

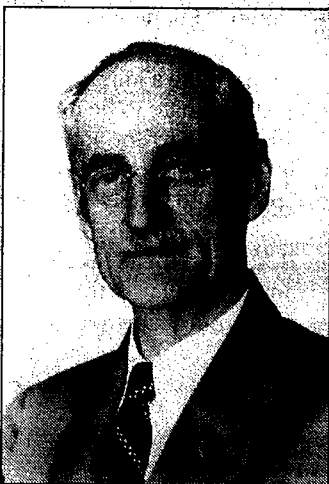
# The Scientists



Carl Schwachhelm (left) and Barnum Brown examine the first Folsom point found in place at the Folsom site in New Mexico.



H. Marie Wormington in the 1930s.



Jesse Figgins, director of the Colorado Museum of Natural History, 1910-1936.



A crew from the Colorado Museum of Natural History, assisted by Father Bilgery (far left), excavates the Dent site in 1933.

logical Survey of the High Western Plains with financial support from CMNH, the Smithsonian Institution, and later the University of Denver and private individuals. The work was concerned prima-

in the *Proceedings of the Colorado Museum of Natural History* entitled "Prehistoric Flaked Points from Colorado and Neighboring Districts" (1931) and "Yuma and Folsom Artifacts" (1932).

**M**OST SCIENTISTS, archaeologists included, specialize in one or two fields of study and stick with them for most of their careers. But there are those archaeologists who specialize, so to speak, in generalization—Renaissance archaeologists who go wherever their interests take them, mastering a variety of topics along the way. An exemplar is Bruce Bradley, recently of Great Britain's Exeter University.

"I find all aspects of archaeology interesting," Dr. Bradley says, "and the same questions can be asked of any time and

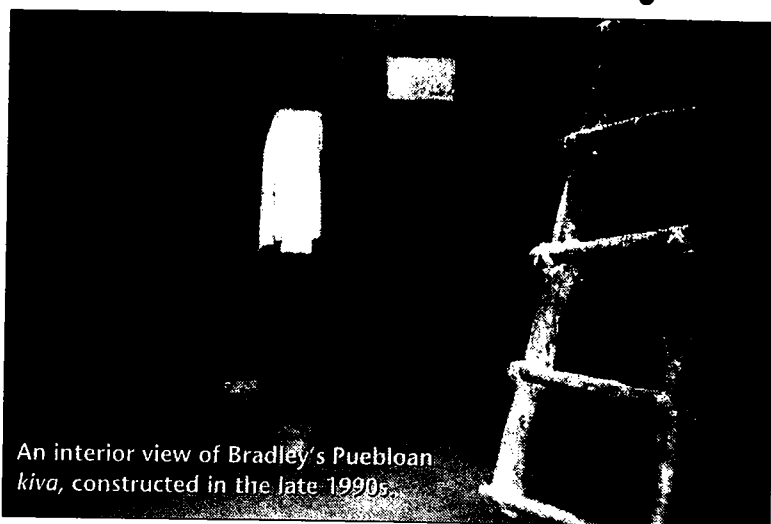
olitic Solutrean culture of Western Europe than they do the thicker, less-refined Dyuktai tools of Pleistocene Asia—the place where traditional theory insists the first Americans must have originated. The theory isn't popular; many researchers find it jarring and at odds with existing paradigms, resulting in attacks from all across the archaeological spectrum.

To Bradley, his varied career is nothing special. "Contrary to being spread too thinly," he insists, "I think each and every experience I have had in my archaeological pursuits has contrib-

uted to insights and approaches I am applying in any given project. I think it is too easy to become so focused on a particular issue or problem and that a wider context of investigating the human experience is possibly more productive, and for me, certainly more interesting and challenging."

## Learning by Doing

# Experimental Archaeology with Bruce Bradley

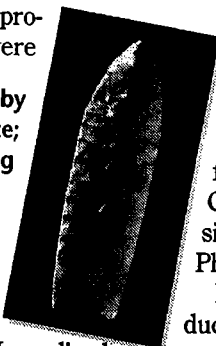


An interior view of Bradley's Puebloan kiva, constructed in the late 1990s.

place. The reason I have done so many different things has to do as much with opportunities as any particular plan." In the last three decades, those opportunities have led Bradley to study Paleoindians; analyze lithics and Southwest pottery; operate his own archaeological services company; organize archaeological excursions in the U.S. and abroad; help governmental and educational agencies consult with Native American groups; design museum exhibits; and direct or co-direct projects in the American Southwest and Kazakhstan, respectively. He has been a research associate at the Pittsburgh Carnegie Museum of Natural History and at the National Museum of Natural History at the Smithsonian Institution. Currently he's adjunct professor at Augustana College in South Dakota and also holds an appointment at Exeter University, where he teaches the world's first master's course in Experimental Archaeology. As if all that weren't enough, he's also a master-class flintknapper and potter who has produced museum-quality replicas for both institutions and private collectors. He has even replicated a complete Puebloan kiva.

Bradley is probably most familiar to readers of **Mammoth Trumpet** as co-ordinator (with Dennis Stanford of the Smithsonian) of the Solutrean migration theory, which proposes that the ancestors of the Clovis people were

**A Goshen Paleoindian point, created by  
Bruce Bradley from Spanish Point agate;  
6 cm (about 2½ inches) long**



migrants from Europe about 15,000–16,000 years ago (MT 16-3, "Towards Resolving Clovis Origins"; MT 17-1, "Immigrants from the Other Side?"). The theory came about as a result of Bradley's lithic studies and forays into experimental archaeology. He realized that Clovis bifaces more closely resemble tools from the Pale-

part of my makeup," he says. "I was born to be a knapper; I had no choice once exposed to it. I am just fortunate to be in a time and place where this particular skill has a current application and where I have been able to pursue it without significant social resistance—although many of my peers and family members wonder what I'm about."

In 1970, Bradley received his B.A. from the University of Arizona. That year he also studied flintknapping with the legendary François Bordes at the University of Bordeaux and at Pech de l'Azé, a site in southwestern France. Afterward, he worked in Lebanon with another top flintknapper, Jacques Tixier, before Prof. Charles McBurney invited him to matriculate at England's Cambridge University in 1971. That summer, he honed his craft at the Idaho knapping school of Don Crabtree, possibly the greatest American flintknapper in modern history. In 1977, after studying at Cambridge University and Southern Methodist University in Dallas, he was awarded one of Cambridge's first Ph.D.'s in experimental archaeology.

Bradley, one of the world's top flintknappers, has produced an acclaimed video ideal for beginning and intermediate knappers. As his career has grown, however, his interests have expanded to cover many other aspects of the field.

### The making of an archaeologist

Like many professional archaeologists, Bradley was drawn into the field by the products of past human cultures. Some of us start out as collectors; others find our way in through pottery replication or flintknapping. Bradley is one of the latter. "Flintknapping is an innate and fundamental

Some of those interests are far indeed from making arrowheads. "My main project right now is working with Dr. Sandra Olsen of the Carnegie Natural History Museum on the origins of horse domestication in Central Asia," he says. "This seems a far cry from my previous interests and experiences, but it is simply the application of my experience and current archaeological methods and theories to another place, time, and archaeological question."

### The archaeology of creation and destruction

Bradley credits flintknapping with stimulating his interest in experimental archaeology, which involves replicating artifacts and other archaeological materials, coupled with experiments to determine how they were used and what happened to them after they were discarded. "As long as I can remember," he says, "I have wanted to know how Indians made arrowheads. It was the exploration of knapping that brought me to archaeology. Now I am director of the only Experimental Archaeology master's course in the world. Some might say this is a long way from a kid wanting to make arrowheads, but it seems like a logical outcome to me."

That Experimental Archaeology master's course is part of the curriculum at Exeter University, where Bradley has taught for the past several years. He finds the work stimulating, passing on his knowledge and experience to a new generation of archaeologists, mainly by teaching them how to make neat things and then put them to intensive use. It's the damage that the handmade artifacts sustain—often up to and including destruction—that provides one of the most graphic learning experiences in archaeology. For example, it doesn't take much utilization to develop polish and use wear on a chipped-stone blade, and different tasks generate different kinds of use wear. With experimental archaeology, it's easy to teach a student to learn the difference between use wear caused by working hides and use wear that results from cutting vegetation.

While you do sometimes get to break or burn down something you've just made, experimental archaeology can't fairly be reduced to such simplistic terms. The field also combines elements of conservation, replication, taphonomy, geology, and several archaeological subdisciplines critical to a proper understanding of site formation. Bradley and his students prepare hides, make ceramic and stone artifacts, build structures in various architectural styles, work various materials with primitive tools, break bones, burn things down, and in general do just about anything our ump-

teenth-great grandparents did before we invented this thing called "civilization."

They divide their experiments into three approaches: experiential, actualistic, and scientific. All three approaches have value, Bradley points out, and some tasks include more than one. Experiential experimentation involves trying to replicate a specific technology with the intention of gaining experience and insight. The actualistic approach applies knowledge and expertise to an archaeological reconstruction in



A Southwestern polychrome ceramic vessel replicated by Bruce Bradley; 25 cm (about 10 inches) in diameter

order to acquire repeatable results. The scientific approach is usually more rigidly controlled than the other experimental approaches, often taking place in a lab.

One recent project stemmed from Bradley's interest in the surface wear he'd observed on some stone artifacts, specifically large pre-cores found at Paleolithic sites in Russia. "The first thing I did," he explains, "was make some replica flint pre-cores and carry them around in a backpack for a while. This showed that wear does occur on the pre-core surfaces. Next, I am designing an actualistic experiment that will simulate the transport of replica pre-cores under several different situations. Finally, the results of these trials will be used to design a highly controlled transport experiment where the variables, identified in the earlier 'experiments,' will be varied to determine cause and effect. Finally, all the results will be compared to the archaeological materials to see if a particular interpretation may be proposed." And that's just one example of the types of projects he and his students undertake during his classes.

### A unique perspective

Learning by doing is a time-honored method of teaching, and experimental archaeology offers some of the best hands-on learning in the field. The students learn how to make items they've been digging out of the ground, as well as how to recognize them after they've survived hundreds or thousands of years of site formation processes. And that's not all they learn. "I'd say the most important result from completing our master's program is the ability to design, perform, and draw conclusions from experiments that have a direct application to an archaeological question," Bradley opines. "Secondarily, the students also learn a variety of methods and venues to bring this knowledge to the profession as well as the public."

Not only do students become familiar with the particulars of the items they make, they occasionally make discoveries that shed new light on the lives of the people they're studying. One of Bradley's own discoveries involving lithic technology was the impetus that led him and Dennis Stanford of the Smithsonian Institution to their

*continued on page 20*

Bradley displays a Clovis blade core at the Gault site in east Texas, 2000.



MICHAEL R. WATERS

**U**NTIL RECENTLY, the earliest archaeological record from the southern continent of the Western Hemisphere was thought to be a simple reflection of known developments in North America. The first South American population was conceived to be highly mobile Paleoindian big-game hunters of Clovis derivation. In fact, however, as well described in recent books by Tom Dillehay (*The Settlement of the Americas*, Basic Books, 2000) and Daniëlle Lavallée (*The First South Americans*, University of Utah Press, 2000), before Clovis times in North America, ca. 11,000 radiocarbon years ago, the

entire length of the continent. They are narrower in extent than the Rockies; but ranges are significantly higher on average, with several peaks over 20,000 ft in elevation. Most of the continent to the east is lowland; the broadest part in-

restricted to the relatively narrow Southern Cone, with cool to temperate rain forest to the west of the southern Andean ranges and grassland/steppe to the east.

The environment of South America

## The Other Half of the Story—



Excavations underway at Taima-talma, Venezuela, in 1976. Ruth Gruhn is mapping the skeleton of the juvenile mastodon with which an El Jobo projectile point fragment was directly associated. In the background a glyptodon carapace exposed in a higher stratum is being prepared for removal.

southern continent had already been settled by populations well adapted to all the major environmental zones, with diverse Archaic-like economies and technologies that bore no relationship to Clovis. It was quite a different world from late-Pleistocene North America.

# Paleoamericans in South America

by Ruth Gruhn

### The setting

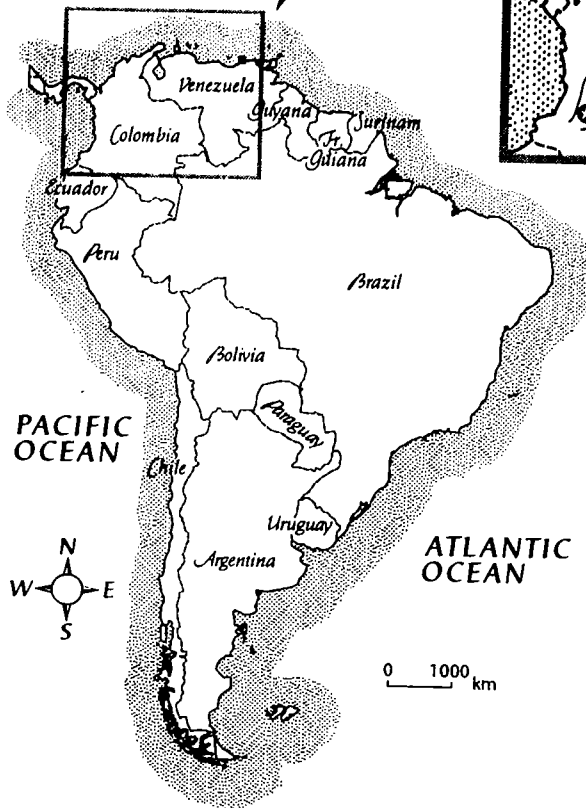
To begin to understand the early South American scene, one has to know the setting. South America's geographical features are markedly different from those of North America. The western mountain ranges, the Andes, extend the

cludes the Amazon basin, a huge area covered by dense tropical forest and dissected by countless large and small waterways. In contrast with North America, the temperate and boreal climatic zones are very limited in area,

during the late Pleistocene was also basically different from the North American scene. During the last glacial maximum (ca. 20,000–13,000 radiocarbon years ago), there was no vast ice sheet and periglacial zone covering a



Localities discussed  
in this article



sea level rose, and rivers aggraded. By about 10,000 radiocarbon years ago, modern climate and vegetation became established and coastlines and river regimes stabilized.

### Newcomers to an ice-free exotic land

The first people must have entered South America through the narrow Isthmus of Panama. Dillehay points out that in moving down through Central

America, the first population would have already become familiar with environments very similar to those found in northern South America, with tropical lowland rain forests, hot semi-arid coastal plains, and temperate uplands. There were hazards encountered when the first pioneers entered the American tropics—venomous snakes, noxious insects, and tropical diseases—but the new environments offered much novelty and promise. By the time the first people reached Panama, they would already have discovered strange creatures of South American origin; not only tapirs, monkeys, and other new species of small mammals, birds, reptiles, and fish, but also species of mastodon and giant ground sloth. As populations expanded well into South America, they would see giant armadillos, glyptodonts, and camel-like animals, as well as new species of horses and deer. On the coasts they would find varied marine life, especially abundant on the Pacific shores. In the tropical, semi-arid, or temperate forests they would discover the value of a great variety of edible, medicinal, and utilitarian plants; and they could exploit a variety of aquatic resources available in streams, lakes, and wetlands. It is small wonder that early South Americans very rapidly developed a diversity of economic and technological adaptations to the varied resources available in so many regions within the southern continent.

The footprints of the first people to enter South America are as faint as those of the first to cross the Bering Straits area. Northwestern South America is rugged country, mostly

forested; and archaeological research has been limited. At present, very few archaeological sites of late-Pleistocene age are documented in Colombia and Venezuela.

### Taima-taima

The best-documented early site in Venezuela is Taima-taima, situated in a small basin within the hilly coastal zone near the

The early occupation floor exposed at the site of Tibitó in highland Colombia.

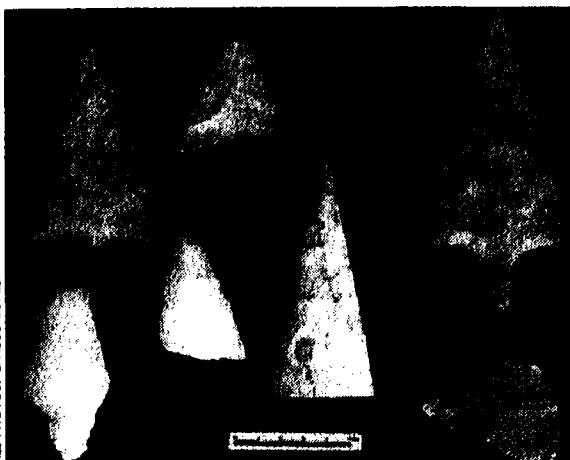
large part of the southern continent. Glaciation was confined to a narrow zone in the high Andes, plus its foothills in southernmost South America, and to most of the rugged island of Tierra del Fuego in the extreme south. Paleoclimatic records suggest that during the last glacial maximum, the climate in most areas of South America was significantly colder and drier than at present; but not extreme. Tree lines on mountain slopes were lower, and forests may have been more restricted in area than now, even within the Amazon basin, with savannas and parklands more widespread. As the Pleistocene came to an end after 13,000 radiocarbon years ago, the glaciers withdrew to the highest peaks,



ALAN BRYAN

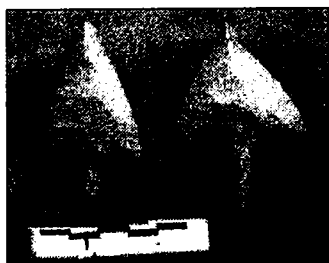
present city of Coro. Within the basin is a permanent waterhole formed by slow seepage of artesian spring water through a cobble pavement. Available paleoenvironmental data indicate that in the late Pleistocene, the local climate was semi-arid as at present, with a vegetation cover of thorn forest. Upon the cobble pavement and incorporated in a deposit of saturated grey sand are the bones of large now-extinct Pleistocene mammals, principally mastodon but also representing glyptodont, giant ground sloth, and horse. Archaeological excavations by José Cruxent, Alan Bryan, and Ruth Gruhn in 1976 exposed

ALL PHOTOS: CARLOS LÓPEZ



Early projectile points from the middle Magdalena area, Colombia.

the butchered remains of a juvenile mastodon with a fragment of an El Jobo-style projectile point within the pelvic cavity. A thick lens of vegetal material found



within the saturated grey sand near the posterior of the skeleton contained small sheared twigs, apparently the masticated stomach contents of the young mastodon; it was dated to ca. 13,000 radiocarbon years ago. It was about that time, then, long before hunters in North America were attacking mammoths with fluted Clovis points, that Venezuelan hunters with the distinctive long, narrow, and thick leaf-shaped El Jobo points were slaying mastodons.

### Tibitó

The best-known late-Pleistocene record in northwestern South America comes from the Sabana de Bogotá, a large irregular basin high in the central mountains of Colombia. Paleoenvironmental data in this area, gathered by T. Van Der Hammen and his associates, indicate that during the last glacial maximum, the Fuquene stadial (about 28,000 to 13,000 radiocarbon years ago), the climate was very cold and dry. During the succeeding Guantiva interstadial (between about 12,500 and 11,000

radiocarbon years ago), the climate warmed rapidly and forests spread into the Bogotá basin. Small lakes and ponds developed under moister conditions, providing a productive environment for early Colombians.

The earliest definite evidence of human presence in the Bogotá basin is associated with sediments correlated by pollen analysis with the Guantiva interstadial. It comes from Tibitó, an open site in a small basin ca. 20 km from the city of Bogotá. Here, in the late 1970s, archaeologist Gonzalo Correal, following up reports of mastodon bones in the area, excavated an early campsite adjacent to a very large sandstone boulder

protruding from the floor of the small basin. He found concentrations of lithic artifacts, bone fragments, and rocks representing activity areas where remains of large mammals were processed. Bones had been broken by impact, and many were calcined by burning. Most of the bones were those of a large now-extinct species of horse; but there were also many fragments of ribs, molars, and tusks of mastodon on the

*continued on page 13*

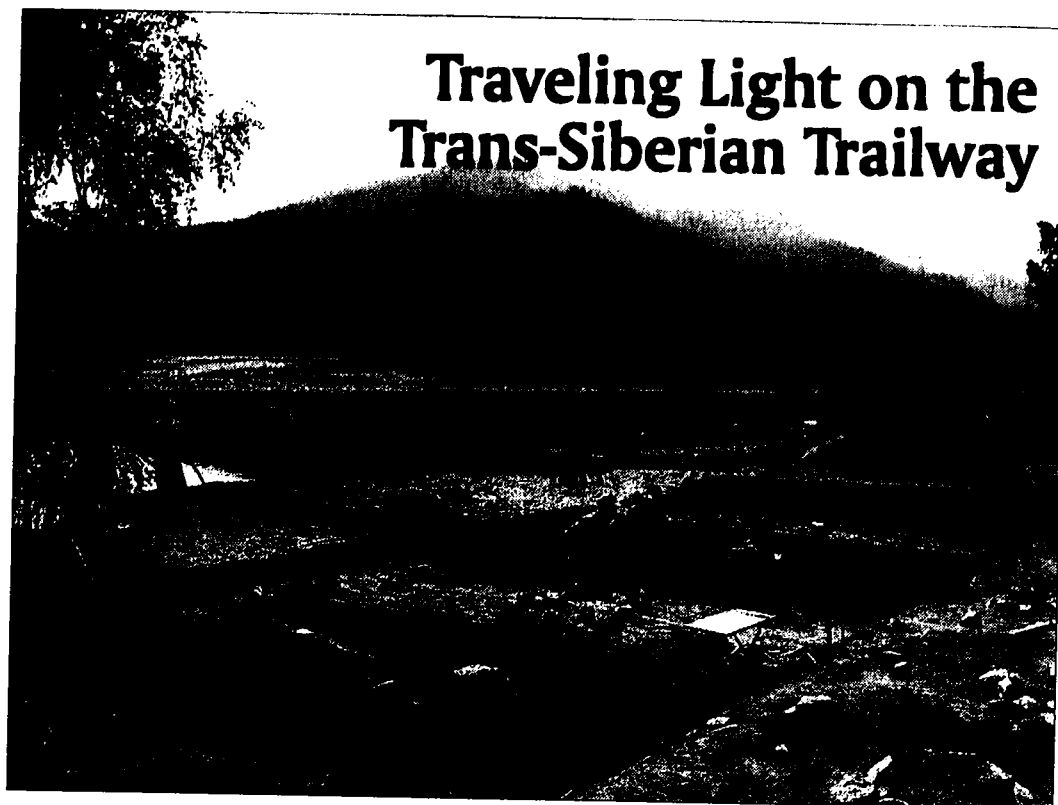
An El Jobo projectile point fragment (arrow, at the tip of the trowel) in situ within the pelvic cavity of the slain juvenile mastodon at Taima-taima.



ALAN BRYAN

# The Site

Russian archaeologists excavating during 2003 field season, with Chikoi River in background.



IAN BUVIT

**A**BOUT 18,000 YEARS AGO, a small group of hunter-gatherers, perhaps a family or two, built a home on the terrace of a river in southern Siberia. They positioned cantaloupe-size cobbles on the ground in an oval shape—we know that much—and odds are they propped some timbers against the cobbles and covered the structure with hides, tipi-style. A few months later, at most, the people abandoned their river home and moved on.

The river soon flooded its banks, gently depositing a thin layer of silt and sand over the cobbles, stone tools, and other discarded or forgotten belongings. This sequence of events—short-term human habitation followed by light flooding—occurred numerous times over the millennia.

## Southern Siberia's Pompeii

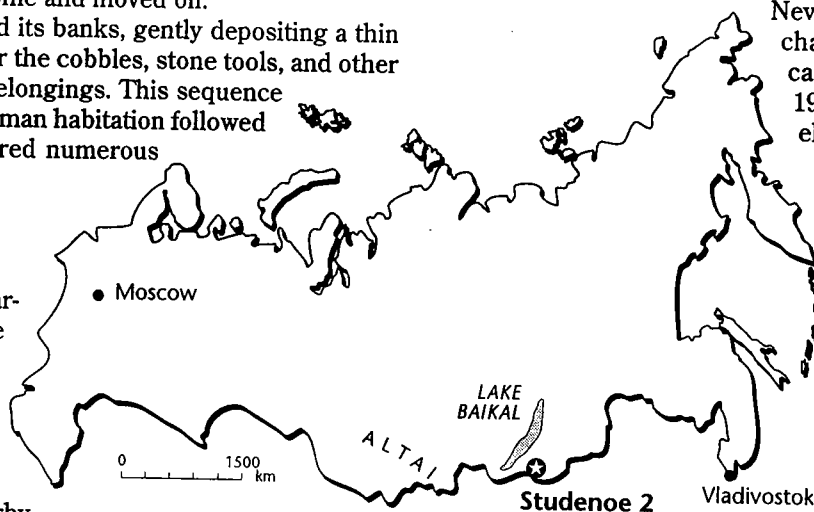
The Studenoe 2 site, as archaeologists now call the place, is situated on a high terrace of the Chikoi River, not far from the Mongolian border, in the Transbaikal region, so named for nearby Lake Baikal, the deepest lake on Earth.

Studenoe 2 contains 15 different cultural strata dating from approximately 20,500 years ago (the late Upper Paleolithic) to the Bronze Age. Mikhail and Aleksander Konstantinov, brothers and co-principal investigators of the site, began investigating the Paleolithic components in 1975 and opened

large-scale excavations in 1986. It wasn't until 1996 that researchers from the United States first got a look at the site, when Russia lifted restrictions on collaboration with Western scholars. The Konstantinov brothers have now excavated about 300 m<sup>2</sup> to a depth of 5 m below the ground surface, and discovered to their delight that the preservation of materials is simply outstanding, says Ted Goebel of the University of

Nevada at Reno, who collected charcoal samples for radiocarbon dating during the 1996 visit. "There's nothing else like it I've ever seen," he says. The cobbles outlining the dwellings and the heavier stone artifacts remain almost exactly as the Paleolithic inhabitants left them; bone needles and even beads made from ostrich shells have survived in the cultural layers.

The "low-energy" flooding between episodes of human occupation is responsible for the preservation and stratigraphy, explains Ian Buvit of Washington State University, a former student of Dr. Goebel's who has worked several seasons at Studenoe 2 and is now writing his dissertation on the late Pleistocene of the southwestern Transbaikal. "The profile is so clear you can almost count the number of different



### Dwelling feature in Cultural Layer 4/5, 1996.

floods over those 20,000 or so years," he says. "It's an archaeologist's dream to have those conditions. It's almost like a Pompeii—the Pompeii of southern Siberia."

But superb preservation and layer-cake stratigraphy wouldn't mean much unless there was something pretty darn interesting about the people who lived at Studenoe 2. Which there is.

### Mobile homes for mobile folks

What's most striking about the cultural evidence at Studenoe 2 is the remains of four dwellings in the late Upper Paleolithic strata. Three consist of cobbles in a circular pattern, roughly 5 m in diameter, with one or more hearths in the center, while one in Cultural Layer 4/5 is an oval of about 19 by 7 m that encompasses 6 hearths.

Most Arctic peoples, who tend to be fairly sedentary, dig deep holes in the earth and construct sturdy, substantial houses half above and half below ground, then enclose them with great care. "They essentially create a 'built environment' that protects them from the long winters of the north," Goebel explains.

But the Studenoe people didn't do that. They erected simple huts or tents on the surface of the ground, expending little time and effort in the process. What could account for this? The bones of red deer, boar, antelope, and rhinoceros



IAN BUVIT

found with the dwellings provide a clue. "If these folks were following herds of animals quite regularly, they might not want to invest so much time in well-built structures," Goebel suggests, especially if they were constantly on the move, traveling hundreds of kilometers each year.

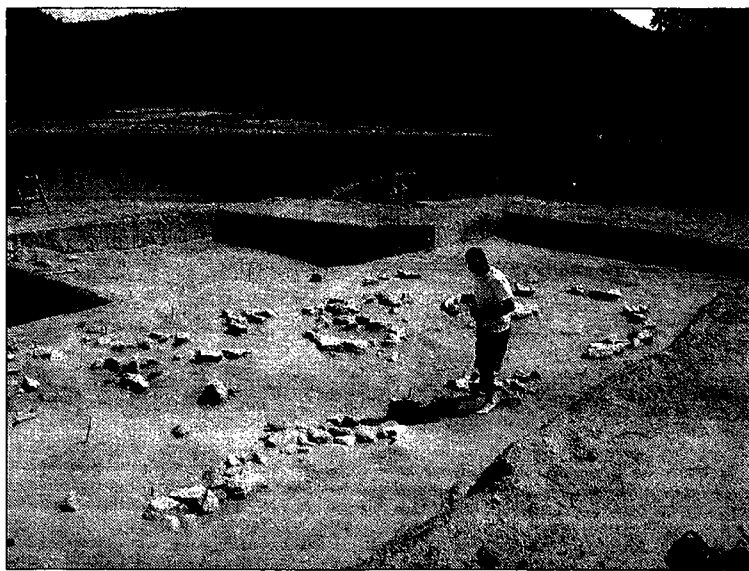
The archaeological evidence indicates the late Upper Paleolithic Studenoe 2 dwellings were most likely seasonal residences, according to Buvit. If people had been living there year-round for extended periods, the accumulation of debris, or garbage, from each occupation would be deep, but the cultural layers

are relatively shallow, less than 10 cm. "They came back and either reoccupied the existing dwellings—this is conjectural—or built new ones in other locations on the terrace near the river," he says.

Somewhat surprising, given the state of preservation, is the absence of any evidence of postholes in the dwelling features. But if wood was scarce, which it probably was at that time and place, the Studenoe people, like recent Plains Indian groups, may have transported timbers from one seasonal residence to another and merely anchored them against the cobbles instead of driving them into the earth. Thus, no postholes.

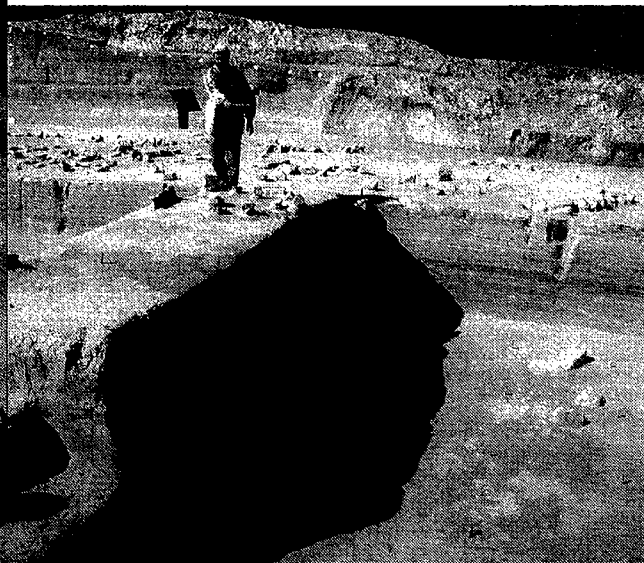
### A Swiss Army knife toolkit

The ephemeral shelters do seem to suggest a high degree of mobility—but there's more evidence. The domi-



Ian Buvit at Studenoe 2, Cultural Layer 4/5 in 2003. ▲

Russian archaeologist Aleksander Konstantinov ► discusses Studenoe 2 stratigraphy.



BOTH: IAN BUVIT

nant characteristic of the stone-tool industry at Studenoe 2 is a profusion of tiny blades, most smaller than 50 mm long and 5 mm wide, designed to be inset in bone or antler to form razor-sharp spears and knives. A skilled tool-maker of the day could manufacture dozens of these microblades from a matchbook-size stone core. And they were lethal. Spears bristling with microblades could easily take down game as large as rhinos or mammoths.

Microblades are exactly the kind of things you would expect to find in the toolkit of a highly mobile culture, Goebel says, and Buvit likens the technology to a Swiss Army knife: "You can do so much with it." A hunter could carry hundreds of the little blades in a pouch and make a new tool or weapon whenever and wherever it was needed.

According to Goebel, the Lake Baikal region may have been where microblade technology first appeared in Siberia, though microblades likely were present in other parts of Asia earlier. Composite microblade tools would become the hallmark of the Siberian late Upper Paleolithic. As the glaciers retreated at the close of the Ice Age, a light industry and prefab houses allowed humans to recolonize northern Siberia. And from there, North America?

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### CURRENT RESEARCH IN THE PLEISTOCENE

Volume 22

2005



A Peopling of the Americas Publication

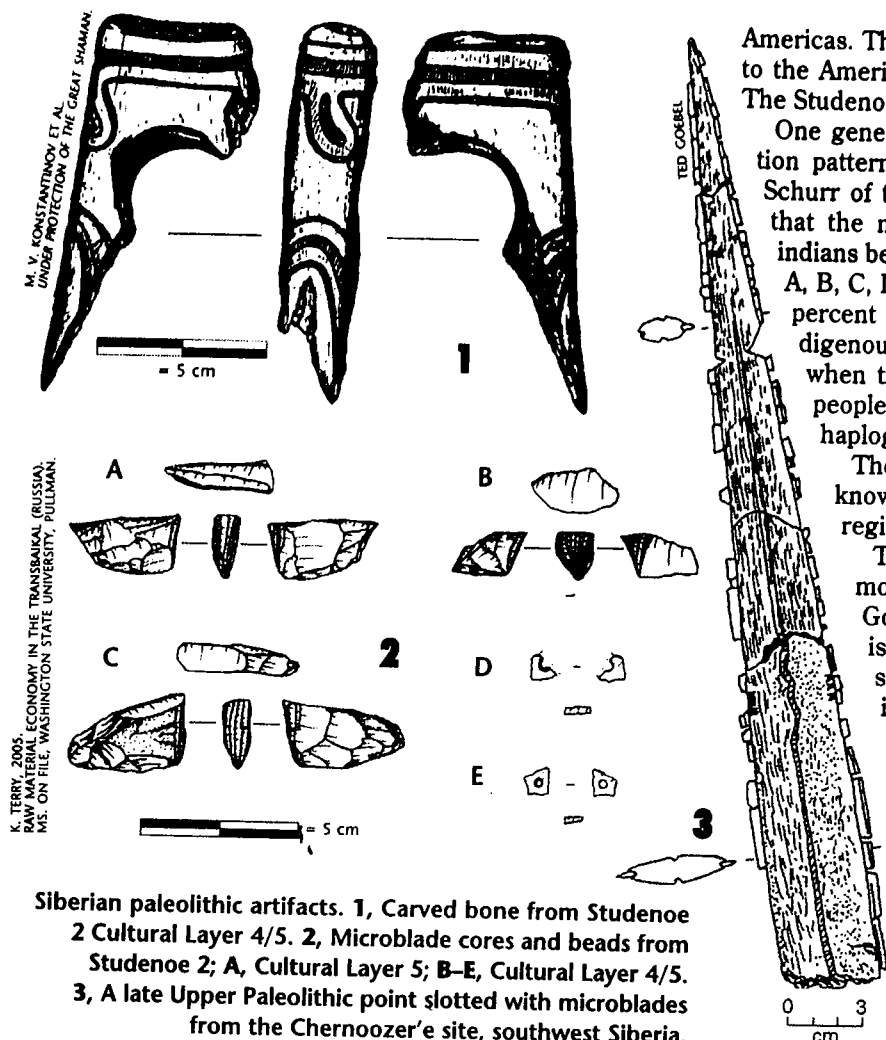
### Implications for the colonization of the New World?

"We have this notion that the peopling of Beringia and the Americas may have been a relatively rapid event that was conducted by really fast-moving people who had a very mobile lifestyle," Goebel says. "Those people at Studenoe weren't living in these big sunken houses in the ground, and they weren't staying there for years and years. They were highly mobile, they left behind tools that represent a very lightweight, mobile toolkit, and they were using the landscape in a way that is very much what we would expect of people who could spread into the Arctic really fast and then be poised to colonize the Americas right at the end of the Ice Age."

Aleksander Konstantinov watches as Karisa Terry and Ian Buvit collect charcoal from Studenoe 2, Cultural Layer 4/5.



IAN BUVIT



Siberian paleolithic artifacts. 1, Carved bone from Studenoe 2 Cultural Layer 4/5. 2, Microblade cores and beads from Studenoe 2; A, Cultural Layer 5; B-E, Cultural Layer 4/5. 3, A late Upper Paleolithic point slotted with microblades from the Chernoozer'e site, southwest Siberia.

Whether the migrants traveled overland across the Bering Land Bridge or by boat along a coastal route, these were the kind of people who could do it.

What's more, many geneticists think the Transbaikal is part of the general region where the ancestors of Native Americans originated—or passed through en route to the


Americas. They further suggest that the earliest migrations to the Americas took place about 17,000–18,000 years ago. The Studenoe 2 site becomes even more intriguing.

One geneticist who specializes in tracing human migration patterns through genetic markers, Theodore (Tad) Schurr of the University of Pennsylvania, has concluded that the mitochondrial DNA of North American Amerindians belongs to five founding haplogroups, designated A, B, C, D, and X. "Together, they encompass 96 to 100 percent of the mitochondrial haplotypes in modern indigenous populations of the New World," he says. So when trying to identify the ancestors of New World peoples, it makes sense to find out where else those haplogroups exist.

There is only one other place where all five are known to occur, Dr. Schurr says, and that is the Altai region, slightly west of the Transbaikal.

The genetic evidence "doesn't mean Studenoe is more important than any other site in the region," Goebel cautions. "But as a site that is there, that is very well preserved, and that has an excellent stratigraphic record, I think it is *among* the most important."

Of course, any discussion of the peopling of the Americas would be incomplete without at least a couple of caveats. Here's a huge one: None of the earliest Paleoamericans used microblades, as far as anyone knows. Furthermore, the Transbaikal was a very long way from Beringia, as Goebel is careful to note. In fact, as the crow flies, it's a distance of some 4,500 km, comparable to the expanse between Fargo, North Dakota, and the western tip of Alaska.

"A lot of people would say, Well, shoot, that site's thousands of miles away, how can it have anything to do with the peopling of the Americas?" Goebel says in his down-to-earth fashion. "But we're trying to find out where these people ultimately came from, and the geneticists say they came from this region, so let's take a look at the archaeology there." 

—Molly Gardner

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#### Suggested Readings

Buvit, I., K. Terry, A. V. Konstantinov, and M. V. Konstantinov 2004 Studenoe 2: An Update. *Current Research in the Pleistocene* 21:1–3.

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Goebel, T. 1999 Pleistocene Human Colonization of Siberia and the Peopling of the Americas: An Ecological Approach. *Evolutionary Anthropology* 8(6):208–227.

Goebel, T., M. R. Waters, I. Buvit, M. V. Konstantinov, and A. V. Konstantinov 2000 Studenoe-2 and the Origins of Microblade Technologies in the Transbaikal, Siberia. *Antiquity* 74:567–575.

Schurr, T. G. 2004 The Peopling of the New World: Perspectives from Molecular Anthropology. *Annual Review of Anthropology* 33:551–583.



## Paleoamericans in South America

*continued from page 8*

occupation floor. Pollen analysis correlated the enclosing sediment with the Guantiva interstadial, and there was a corresponding radiocarbon date of  $11,740 \pm 110$  RCYBP for the occupation.

Given the abundance of processed animal bone at Tibitó, which strongly implies hunting, North American archaeologists would expect to find bifacial stone projectile points in the lithic assemblage recovered from the occupation floor; but there were none. A sampling error might be assumed; in fact, however, stone projectile points and indeed bifacial artifacts of any kind were very rare in the Bogotá basin until late-prehistoric times. The hundred or so lithic artifacts recovered from the occupation floor at Tibitó were very simple unifacial tools, small amorphous cores and flakes of a local stone with minimal retouch forming small projections and concavities. Most likely these were tools used to work wood or bone. Similar unifacial lithic industries were found in many areas of South America in late-Pleistocene times.

### Middle Magdalena Valley


More recent archaeological research in the region to the northwest of the Sabana de Bogotá, in the lowlands of the middle Magdalena Valley, has demonstrated that by late-Pleistocene times there was already regional cultural diversity within Colombia. Archaeologist Carlos López and his associates have located several open campsites on old river terraces, with radiocarbon dates extending back to the 11th millennium before present. López and his associates, who have carried out detailed geomorphological studies in the region, point out that due to extensive erosion and deep alluviation within the river valley before 11,000 radiocarbon years ago, it is unlikely that any earlier archaeological sites have been preserved for discovery—most unfortunately, because the long north-to-south-trending Magdalena Valley could have been an early route from the Caribbean into the Andes.

In contrast with contemporary sites on the Sabana de Bogotá, the early lithic industries at the middle Magdalena sites feature bifacial flaking as well as simple unifacial tools; and distinctive projectile points with long triangular blades and contracting stems have been recovered. No faunal remains have been preserved in the sediments; but given the contemporary environment of forest and wetlands, archaeologists hypothesize that terrestrial game and diverse aquatic resources, including fish, turtles, manatee, and capybara, were important.

### San Isidro

Recent discoveries at the early site of San Isidro in the tropical lowlands of the upper Cauca valley in southern Colombia indicate to archaeologist Cristobal Gnecco that the first colonizers of northwestern South America were foragers who were already manipulating a variety of vegetal and animal resources within local territories. At this single-component

occupation site, which is dated ca. 10,000 RCYBP, fossil phytoliths and pollen grains, and charred seeds suggest that the early forest dwellers first opened a small clearing, then collected edible plant species found widely scattered in the tropical forest and brought them to their campsite for planting and tending. We shouldn't be surprised when unquestionable evidence is offered for early-Holocene plant domestication in the South American tropics, since it now appears that late-Pleistocene colonists were already managing their environment.

The earliest peoples in the South American tropics, then, were not all highly mobile and migratory hunters who focused upon a few animal species. Rather, they were foragers who settled into specific local territories and actively exploited a variety of resources. In the next article of this series, I shall discuss the archaeological record of Paleoamericans in the forests of Brazil. 

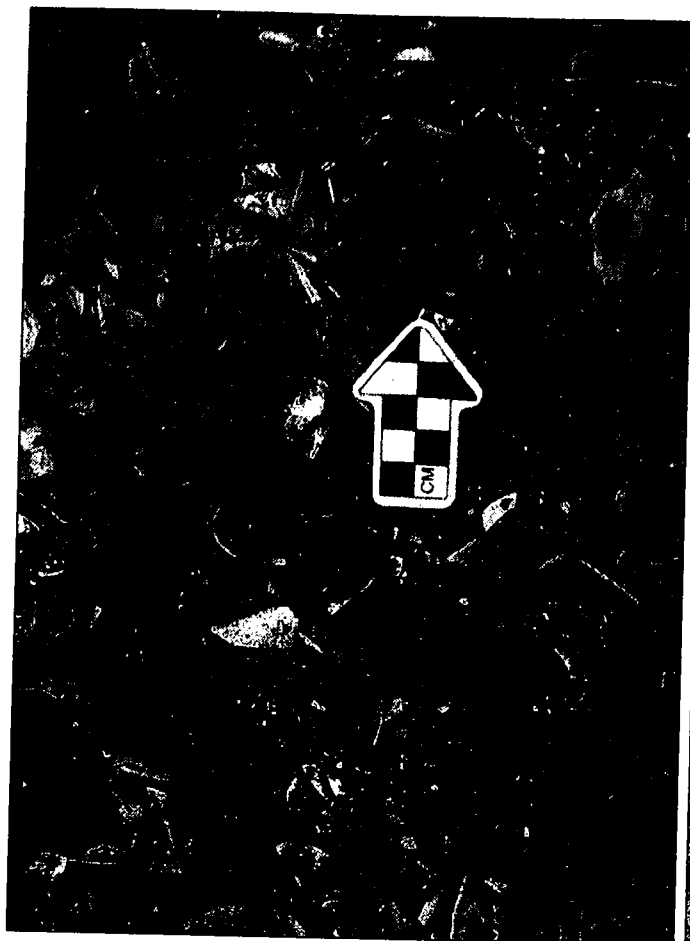
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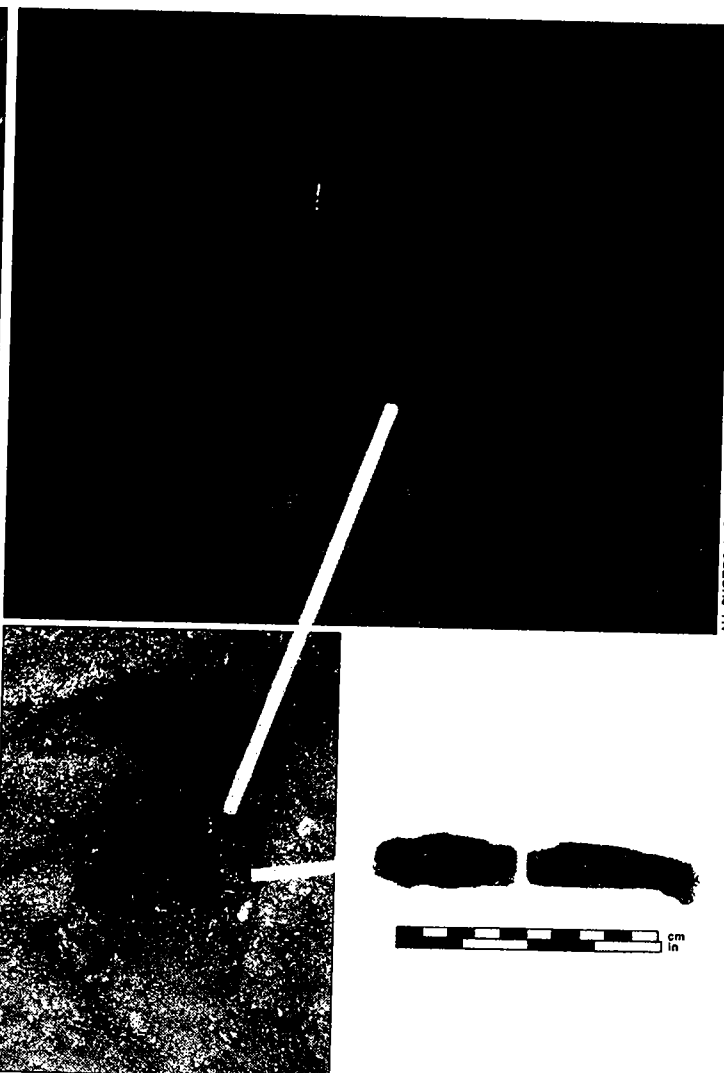
**About the author** Ruth Gruhn is Professor Emerita in the Department of Anthropology at the University of Alberta, Edmonton, Canada. In 1969–70, with her husband, Alan Bryan, she visited a number of early archaeological sites in Central America and South America. This overland tour by Land Rover led on to excavations at the sites of Los Tapiales in Guatemala in 1971, El Bosque in Nicaragua in 1975, Taima-taima in Venezuela in 1976, and six cave sites in Brazil in 1984–85. Since the late 1990s she and Alan have been involved in archaeological research in northern Baja California, with excavation projects at the Abrigo Pare-dón near Laguna Seca Chapala in 1997 and 1999, and at the Abrigo de los Escorpiones near Eréndira from 2000 through 2004. The photo shows Dr. Gruhn in the field laboratory near Eréndira in 2000. Her articles in CSFA books *New Perspectives on the First Americans* and *Paleoamerican Origins: Beyond Clovis* (the latter soon to be published) summarize the significant early archaeological sites in South America.



ALAN BRYAN



Quebrada Jaguay. Left, detail of shells and fish in Sector I. Right, post-holes (marked with balloons), with details of in-situ post, from a Paleoindian-age house in Sector II.



ALL PHOTOS AND DRAWINGS: DANIEL SANDWEISS

# Early Maritime Adaptations in Western South America

## Conclusion

by Daniel H. Sandweiss

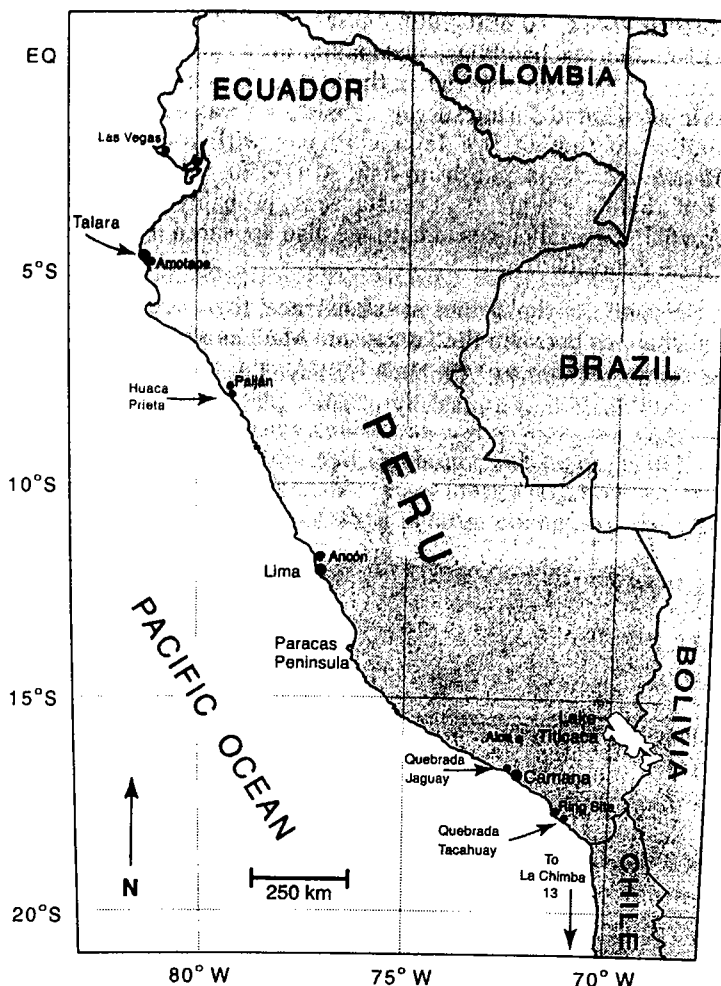
### Quebrada Jaguay

In the early 1990s, Peruvian archaeologist Bernardino Ojeda told me about an early date (around 11,800 CALYBP) from Quebrada Jaguay 280 (QJ-280), a coastal site near Camaná in southern Peru. On an initial visit to the site in 1992, the still-open pits clearly showed that the site contained abundant remains of shells and fish. In 1996, I began excavations at Quebrada Jaguay and continued with a second season in 1999. I also carried out a full cover survey in the area between Quebrada La Chira and the Camaná River, from the shoreline inland to about 750 masl. Working with a team of Peruvian, Canadian, and U.S. archaeologists and analysts, we determined that Quebrada Jaguay was a fishing site occupied between about 13,000 and 8300 CALYBP, based on a suite of 41 charcoal dates. Distinctive assemblages and an additional 20 dates from sites recorded and



tested during survey established the following local chronology.

**Jagway Phase, 13,000–11,400 CALYBP** This phase, present only at QJ-280, is characterized by an exclusive dependence on seafood for the animal portion of the diet. Further, the inhabitants focused on two taxa of marine animals, drum fish (*Sciaenidae*) among the vertebrates and the wedge clam *Mesodesma donacium* among the invertebrates. Heather McInnis's reconstruction of standard length of the drums using otoliths strongly suggests fishing using nets rather than hooks. Peruvian botanist Asunción Cano's analysis of the scarce macrobotanical remains identified prickly pear seeds (*Opuntia* sp.) and horsetail (*Equisetum* sp.). In Sector II, we uncovered multiple post holes from part of a frequently rebuilt house that had a possibly rectangular plan. We found one post base still in situ in one of the holes. An induration event took place just after the last rebuilding of the house; geochemical studies by Fred Andrus determined that seawater deposition and evaporation in the midden created a rocklike cement. An indurated surface mold seems to record a hanging panel from the wall. Similar structures using wooden frames and reed panels are still built in the area today, and in an early-Holocene context intruded into the house deposit we found a piece of knotted reed identical to modern specimens. Dolores Piperno's analysis of phytoliths from this sector showed generally impoverished and degraded samples, but a basal context produced a number of reed (*Phragmites* sp.) phytoliths that might be derived from building material. Obsidian found in small quantities throughout the Jagway Phase deposits has been chemically traced to the highland Alca source, some 165 km to the east and north. Although some Alca obsidian crops out as low as 2850 masl, University of Maine graduate student Kurt Rademaker recently discovered that the main source lies between 3800 and 4800 masl. Ben Tanner and Martin Yates's study of the lithic remains at QJ-280 shows that the majority were acquired locally, coming mainly from Tertiary delta deposits that crop out on the slopes above the Quebrada Jagway region. Site inhabitants also used petrified wood, probably from an outcrop some 30 km up the Quebrada. We found few tools but abundant late-stage debitage, consistent with a domestic function for the site. Most likely, tools were roughed out at quarry sites, finished at QJ-280, and used elsewhere. In general, the characteristics of QJ-280 during the Jagway Phase suggest a



- Archaeological Site
- Modern city

seasonal residential base camp occupied most likely during the austral summer when the ephemeral Quebrada flows. During the winter, the population may have traveled to the highlands, as suggested by the presence of obsidian and of prickly pear seeds. However, it's also possible that they acquired the obsidian and

prickly pear during short forays inland or via trade and that they spent the winter in the nearby Camaná Valley, which is well watered by a large permanent stream. After millennia of intensive agriculture, it's unlikely that we will ever find evidence of early occupation in the valley bottom even if such existed.



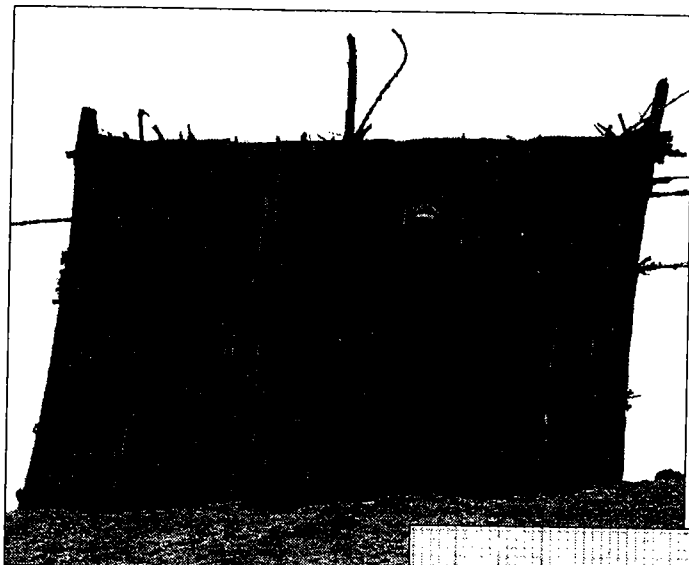
Sandweiss on high-tech photo tower during the 1999 season at Quebrada Jagway.



**Machas Phase, 10,600–8000 CALYBP** At QJ-280, we found a substantial Machas Phase occupation in Sector I and a thin veneer of Machas material on the surface in Sector II. Here, as in sites found during survey, subsistence was substantially similar to that of the Jaguay Phase, with its focus on *Mesodesma* clams and drum fish. At QJ-280, we also recovered abundant remains of crustaceans, probably freshwater crayfish. Several pieces of cordage also appeared in Machas Phase deposits.

Despite the similarities in subsistence, there are substantial changes between the Jaguay and Machas Phases:

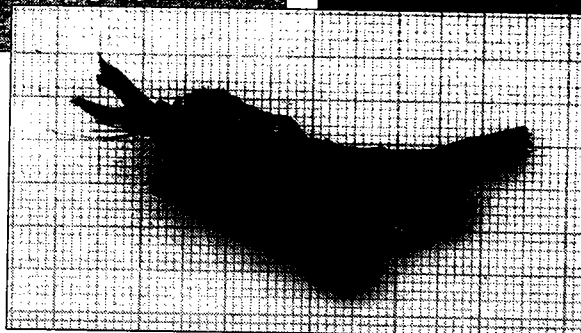
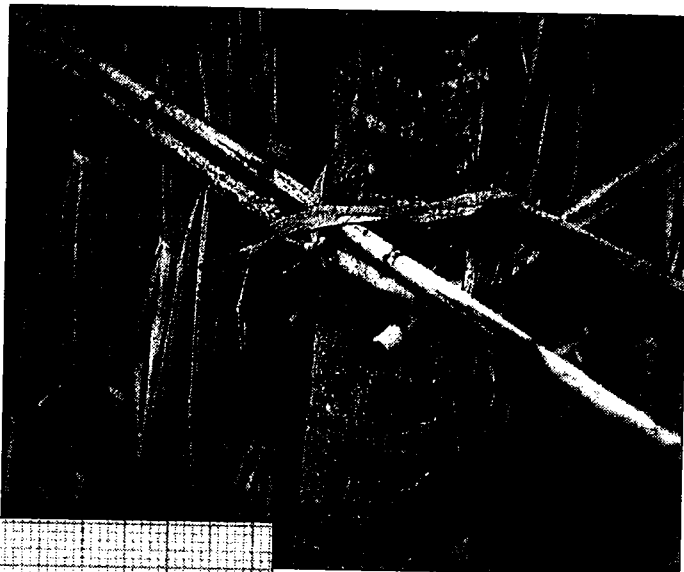
- **Settlement pattern:** Although we have basal dates from 17 sites, including a majority of sites with surface remains



(Above left) modern traditional house near Quebrada Jaguay made of wooden posts and reeds. (Above right) detail of reeds used to attach reed panels to post framework. (Right) knotted reed from early-Preceramic deposits at Quebrada Jaguay Sector II.

- ent coastal habitats including Quebrada bank and *lomas*.
- **House layout:** In Sector I, we excavated one quarter of a circular, semisubterranean house 5 m in diameter with a central hearth. This plan contrasts notably with the Jaguay Phase rectangular, post-built structure in Sector II but fits well with the layout of other houses dating the early- and middle-Preceramic Periods and with theoretical expectations for early houses.

In general, the Machas Phase remains indicate that the site remained a seasonal residential base camp, as it had been during the preceding Jaguay Phase. However, it now seems likely that the inhabitants spent part of the winter among the cobble quarries in the adjacent *lomas* zones, which flourish



during that season. We no longer find evidence of contact with the highlands.

Following the Machas Phase, the Quebrada Jaguay survey region experienced an apparent occupational hiatus that coincides closely with the *silencio arqueológico* of the Atacama region in northern Chile. Settlement

resumed in the region after about 3500 CALYBP, but that is beyond the time frame for this paper.

### Quebrada Tacahuay

Some 230 km south of Quebrada Jaguay, David Keefer, Susan deFrance, and their colleagues found and excavated terminal-Pleistocene archaeological deposits exposed in profiles along the Quebrada Tacahuay. Charcoal dates range from about 12,000 to 12,900 CALYBP. The excavations have produced a substantial vertebrate faunal assemblage emphasizing seabirds, with some fish and mollusks. The marine species are typical of the Peru Current today. No information is yet available on plant use. A substantial flood deposit overlies and seals the terminal-Pleistocene archaeological deposits, suggesting El Niño-like conditions shortly before 11,000 CALYBP. Shortly after that event a reoccupation dated to the

indicative of either Jaguay or Machas Phase occupation, none dates before 10,500 CALYBP except QJ-280. Many of the Machas sites are located in the lower *lomas* zone in and around the delta outcrop. Thus, there was a substantial expansion of local settlement during the Machas Phase.

- **Lithic resource use:** The settlement expansion coincides with a change in lithic resource use, with obsidian almost absent and an expanded use of lower-quality sandstone from the quebrada bed adjacent to QJ-280. Together with the settlement pattern change, the focus on local lithics suggests a settling in on the coast. We have suggested that Jaguay Phase inhabitants spent part of the year in the highlands, including the Alca area, while in Machas Phase times they spent most of the year moving between differ-

Pleistocene/Holocene transition includes birds, marine and terrestrial animals, reptiles, fish, and mollusks. In the terminal-Pleistocene/Paleoindian-age deposits, lithics are local, terrestrial fauna is absent, and although hearths are present, there is no evidence for structures as at Quebrada Jaguay. The excavators believe that the site was a "specialized coastal extraction station" (a logistical field camp in Binford's terms) for processing seabirds.

### Complejo Huentelauquén

Llagostera's work at La Chimba 13 (a.k.a. Quebrada de las Conchas) offered one of the first examples of an early-Preceramic maritime site in the Andes, though the two dates available in the 1970s were early Holocene rather than terminal Pleistocene and therefore slightly later than dates then available for highland sites. More recently, Llagostera and colleagues have acquired additional dates for a total of 13, with a range of about 9500 to 11,700 CALYBP (with one outlier at about 7800 CALYBP).

At La Chimba 13, the vast majority of faunal remains are marine, principally fish and mollusks but also including sea mammals and seabirds. A small number of terrestrial animal remains were recovered, including camelid bones.

Llagostera and his colleagues have now dated several other sites from the same Huentelauquén cultural complex to which they assign La Chimba 13. Two of these sites (El Obispo and Los Medanos 2) have terminal-Pleistocene dates associated with the remains of mollusks, fish, seabirds, and small numbers of marine and terrestrial mammals. Other sites of the Huentelauquén complex located further south date to the early Holocene and have a larger terrestrial presence among the faunal remains.

The terminal-Pleistocene dates from the northern Huentelauquén Complex sites overlap with the early occupations at Quebradas Jaguay and Tacahuay and extend the geographic extremes of known early maritime adaptations from far northern Peru to northern Chile.

### Conclusions

What can we learn from this growing but still spotty record of terminal-Pleistocene, maritime-adapted sites in western South America? The sites show that a model of late discovery of the ocean resources can no longer be sustained; people knew how to exploit the sea when they first arrived in western South America, or shortly thereafter. Beyond that, the new data touch on three, interrelated questions:


- Which migration route or routes were used for travel into and through western South America?
- What was the subsistence adaptation of these early South Americans? and,
- What was the social organization of these people?

When Quebrada Jaguay and Quebrada Tachuay were first reported in 1998, many commentators saw them as proof of the long-suspected coastal migration route through the Americas. Certainly, these sites demonstrate the presence of people with appropriate adaptations to support this hypothesis. However, we are far from demonstrating that a coastal

route was actually used. Although the Amotape campsites, the Ring Site, and Quebrada Tacahuay lack any evidence of contact with the highlands, obsidian from Quebrada Jaguay shows a definite connection to the highlands. People must have gone up to the mountains, at least on brief forays. Coastal, highland, or parallel migration routes all remain possible—we have far too few sites to connect the dots, nor have we developed a proven means of assessing relationships between inhabitants of different early sites. The known early maritime sites contain few finished artifacts and no human skeletal remains for comparison; for the moment lithic debitage is the only cultural material that might show relationships. Ben Tanner has established a protocol for technological analysis of such collections and applied it to samples from Quebrada Jaguay and Quebrada Tacahuay. However, we need to collect and analyze many more assemblages in the same way before the database is large enough to interpret intersite connections.

In assessing early subsistence systems, we are on firmer ground. The old model of big-game hunting as the exclusive Paleoindian economic strategy has fallen by the wayside. The growing archaeological record for terminal-Pleistocene subsistence also includes fishing, small-game hunting, and increasing evidence of use and even manipulation of plants. Indeed, as Tom Dillehay has indicated, many Paleoindian-age terminal-Pleistocene sites reflect a diet once thought typical of the Archaic period.

Terminal Pleistocene sites of the Peruvian and northern Chilean coasts are too few and too incompletely excavated to offer any firm conclusions about organization. Further, sea level change adds a complicating factor to the settlement record. In the Paján region, for instance, we know that people had contact with the coast and harvested marine organisms, but shoreline of the time now lies many kilometers offshore along with any sites dedicated to maritime fishing and gathering. Did the same group move between shoreline and coastal plain, or were there separate groups who traded? In the south, we have a probable base camp at Quebrada Jaguay and a probable logistical camp at Quebrada Tacahuay, but given the distance between them, it is unlikely that they belonged to the same settlement system. The maritime-adapted sites of the Huentelauquén Complex in northern Chile are also far apart.

The last several decades of research on early coastal sites of western South America have shown us where to look for maritime-adapted sites. There is every reason to believe that many more such sites will come to light in the next decades and will lead us closer to understanding the first inhabitants of the region. 

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## The Denver Museum

*continued from page 3*

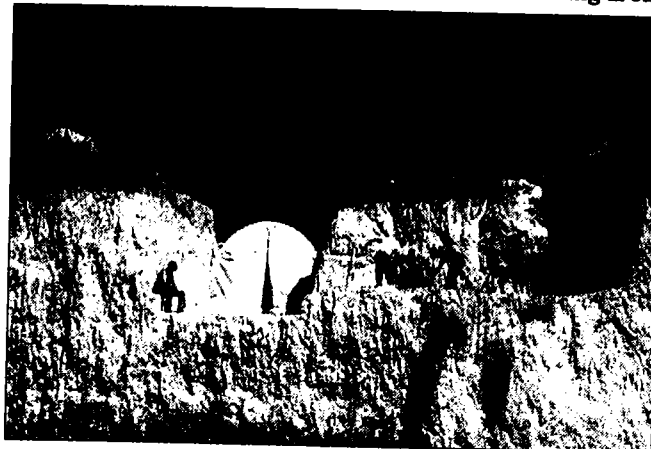
crew. The Smithsonian Institution continued excavations at the site until 1940. The Lindenmeier site, the largest Folsom site in North America, is important because it represents a large campsite, probably occupied repeatedly over many years.

A crew excavates 3½ m deep in late-Pleistocene loess at the La Sena mammoth site in 1990.

### The H. Marie Wormington Era, 1935–1968

Hannah Marie Wormington, a native of Denver, received her bachelor's degree in anthropology at the University of Denver in 1935 studying under E. B. Renaud. She was hired by CMNH in 1935 as staff

Folsom occupation near La Porte, Colorado. Unfortunately, the site was largely destroyed by erosion. In 1939, Wormington published her first edition of *Ancient Man in North America*, a book that



went through four editions, the last and most famous published in 1957.

Wormington was instrumental in defining several Paleoindian projectile point types, formerly variants of the old

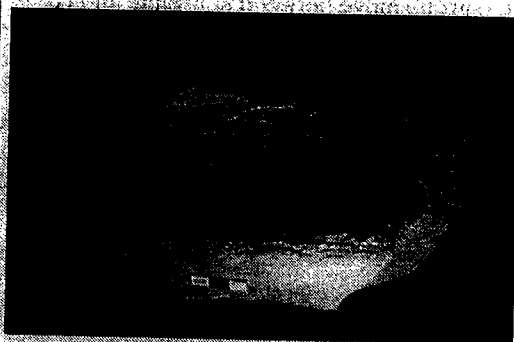
Wormington's Paleoindian fieldwork in Colorado continued in the 1960s. The Frazier site, excavated from 1965 to 1967, is a 10,000-year-old bison processing area along the South Platte River east of Greeley. The site contained distinctive Agate Basin spear points. This was the last Paleoindian research Wormington conducted for DMNH before she left the Museum in 1968. The Department of Anthropology was formed in 1969, a year after Wormington left.

### The Interim Years, 1969–1993

Although the Denver Museum did not have a Paleoindian archaeologist between 1969 and 1993, activities relating to the subject continued. Jane Day became curator of archaeology in 1985. She helped organize a 1988 symposium at DMNH in honor of H. Marie Wormington concerning the Paleoindian occupation of the Rocky Mountain region. Day and Dennis Stanford, Paleoindian archaeologist at the Smithsonian, developed for the occasion a special exhibit, "Ice Age Hunters: The View from Colorado," which contained artifacts from 17 Paleoindian sites in Colorado. Stanford and Day edited a book in 1991 entitled *Ice Age Hunters of the Rockies*, compiled from papers presented at the symposium.

## Milestones in Western Archaeology

# Megafauna Remains



Fragment of mammoth limb bone from the La Sena mammoth site. The impact notch and negative cone of percussion at upper center are evidence it has been worked.



Fragment of cortical limb bone from the Lovewell mammoth site in north-central Kansas. It has been bifacially flaked—note the two flake scars extending from top to bottom.

archaeologist when Jesse Figgins formed the Department of Archaeology. Dr. Wormington was promoted to curator of archaeology in 1937. Her first Paleoindian field research came in 1936 when she excavated the Johnson site, a

Yuma type, in a 1948 article entitled "A Proposed Revision of the Yuma Point Terminology" in *Proceedings of the Colorado Museum of Natural History*. The point types named by Wormington have become standard in the literature.

### The James Dixon Era

E. James Dixon was curator of archaeology at DMNS from 1994 to 2000. During this period he excavated On Your Knees Cave on Prince of Wales Island in southeastern Alaska (MT 20-4, "Exploring the Northwest Coast: E. James Dixon and the Peopling of the New World"). This site is important to our understanding of the early human occupation of North America because artifacts and human remains from the cave are 9,200 to 10,300 years old. These data indicate that people were present on the islands of southeast Alaska and were adapted to a marine-oriented lifestyle at this early period. He also conducted research at the Lamb Springs site in south Denver, a site containing many mammoths with possible human association. Dixon pub-



lished an important book, *Bones, Boats, and Bison*, suggesting the early coastal migration route was probably used by early people to migrate down the west coast of North America during the latter part of the last glacial period.

Pleistocene that forced animals and humans to migrate for survival.

Field research is being conducted at several mammoth sites in southwest Nebraska and north-central and western Kansas that date to 12,000–20,500 RCYBP

America from 22,000 to 40,000 years ago, before ice sheets covered Canada. Holen's article in the January 2006 issue of *Quaternary International* documents the fracture patterns on limb bones from two of these Last Glacial Maximum-age mammoth sites.

## Milestones in Western Archaeology Artifacts



The Dent site excavation in 1933. The Clovis point in situ (arrow) is the same one shown below.

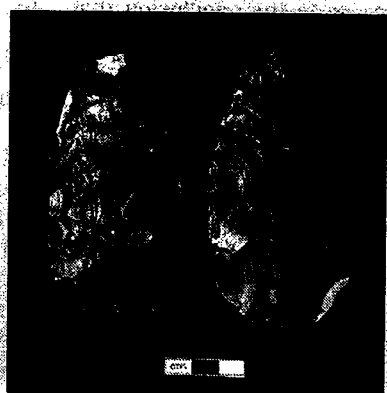


Folsom point in situ between bison ribs at the Folsom site in New Mexico, now on display in DMNS.




◀ Clovis point excavated at the Dent site, 1933.

Clovis bifacial preforms from ► south-central Nebraska. The material is Edwards chert from central Texas.



### Conclusion

The discovery of Clovis points associated with mammoths and the definition of the Clovis culture led to the development of a new model of human migration to North America, the Clovis-first theory. This model declared that the Clovis culture was the colonizing group that first arrived in North America 11,500 radiocarbon years ago (about 13,500 calendar years) and that these efficient hunters upon their arrival slaughtered to extinction many types of animals like mammoths and camels. The DMNS is excavating mammoth sites as much as 9,000 years older than Clovis that exhibit distinctive fracture patterns that could only be made by humans; these discoveries are challenging the Clovis-first model, which dominated the profession for the last half century. Jesse Figgins's 1927 *Natural History* article announcing the Folsom discovery states, "When we analyze the technical opposition to the belief that man has inhabited America over an enormous period of time, we find . . . a failure to appreciate properly all of the evidence." This statement

is as true today as it was then. The Denver Museum continues to play a leadership role in the discovery of evidence that will answer the question of when humans first arrived in North America. 

### Recent Research

Steven Holen, curator of archaeology since 2001, is continuing the Museum's tradition of research concerning the early peopling of the Americas. Recent research includes documenting the long-distance movement of stone tools during the Clovis period. Spear points found at distances of 400–900 km from outcrops of that stone indicate that some Clovis groups migrated great distances across the Plains. This high degree of human mobility can be attributed to rapid climate change at the end of the

(MT 10-1, "Bones of Nebraska Mammoths Imply Early Human Presence"; MT 20-4, "The Kanorado Sites: Early Americans on the High Plains of Northwestern Kansas"). Fracture patterns on mammoth limb bones, suggesting that humans deliberately broke the bones to make preforms for producing patterned bone tools like projectile points and shaft wrenches, have the same characteristic fracturing and flaking found on mammoth limb bones at Clovis-age mammoth sites. These early mammoth sites suggest that humans came into North

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**About the author** Steven Holen serves as Curator of Archaeology and is presently Acting Chair of the Department of Anthropology at the Denver Museum of Nature & Science, where he began work in 2001. He earned B.A. and M.A. degrees from the University of Nebraska and a Ph.D. from the University of Kansas. He has worked as an archaeologist for the Nebraska State Historical Society, University of Nebraska State Museum, and the U. S. Natural Resources Conservation Service during his career. Dr.



Holen's regional focus is in the central Great Plains, where in recent years his research has concentrated on Clovis and pre-Clovis sites, particularly on Clovis lithic procurement patterns and human adaptation to climate change at the Pleistocene/

Holocene boundary. He is also investigating several mammoth sites in order to determine the difference between natural and human-induced fracture patterns on mammoth limb bone.

### Suggested Readings

Dixon, E. J. 1999 *Bones, Boats and Bison: Archeology and the First Colonization of Western North America*. University of New Mexico Press.

Figgins, J. D. 1927 The Antiquity of Man in North America. *Natural History*. Vol. XXVII (3):229-239.

——— 1933A Further Contribution to the Antiquity of Man in America. *Proceedings of the Colorado Museum of Natural History* 12(2).

Holen, S. R. 2006 Taphonomy of Two Last Glacial Maximum Mammoth Sites in the Central Great Plains of North America: A Preliminary Report on La Sena and Lovewell. *Quaternary International* 142-143:30-43.

Stanford, D. J. and J. S. Day (editors) 1992 *Ice Age Hunters of the Rockies*. Denver Museum of Natural History and University Press of Colorado.

Wormington, H. M. 1957 *Ancient Man in North America*. Popular Series No. 4. Fourth Edition. The Denver Museum of Natural History.

## Experimental Archaeology


*continued from page 5*

unique theory of Solutrean migration to the New World. After long and careful study, Bradley came to the conclusion that overshot or *outré passé* flaking—detaching large flakes that travel completely across the artifact and remove part of the opposite edge—was practiced deliberately and systematically in some lithic reduction strategies, rather than being the result of careless craftsmanship. Two cultures that practiced this method of stone tool manufacture are the Solutrean and Clovis cultures, both of which prized thin, lanceolate bifaces and projectile points. "This interpretation came from observations of archaeological materials, replication studies, recomparisons, more replications, etc.," he says. "This 'discovery' is currently at the center of the debate about the origins of the North American Clovis culture."

### Atlantic crossing?

Could the Solutreans, who vanished from the European archaeological scene about 16,000 years ago, have crossed the Atlantic to start over on American shores? Although he's careful to point out that it's just a theory, Bradley stands behind the idea (MT 17-1, "Immigrants from the Other Side?"). "The more we research it and the more new data come in from around the world," he explains, "the better the theory seems to fit what we know. I want to emphasize that I don't 'believe' that the Solutreans were ancestral to Clovis; it is the huge concurrence of positive data in North America and Southwest Europe, and the near absence of comparable data in Asia, that supports our contention. I fully expect this most controversial of theories to be a topic of debate for years to come."

The logical thing to do to bolster the theory would be to find evidence bridging the gap between the Solutreans of 16,000 years ago and the Clovis peoples of 12,000 years ago. Bradley and Stanford believe they've found that evidence. The Cactus Hill site in Virginia, discovered and excavated by researcher Joe McAvoy, has a distinct Clovis component; however, there are artifacts underlying the Clovis material that appear to predate it. Included in this potential pre-Clovis lithic assemblage are tools that display affinities to both Clovis and Solutrean artifacts. Is this the clincher that proves the Solutrean-Clovis connection? It just might be, but Bradley and Stanford are always on the lookout for more data.

Bradley isn't blind to the other evidence regarding early human occupation of the New World. What the Solutrean theory does is question the idea that the first Americans were exclusively Asian. "Current data seem to indicate that there was an overwhelming colonization of North America out of Asia beginning about 12,000 years ago. This is quite apparent. The question is, Does this account for all of what we see in the early archaeological record? Our answer is that it does not. I will be quite surprised if we don't end up with a dominant multiple-entry theory within the next few years. The data are piling up that Clovis-first and Asia-only are no longer viable." 

—Floyd B. Largent, Jr.

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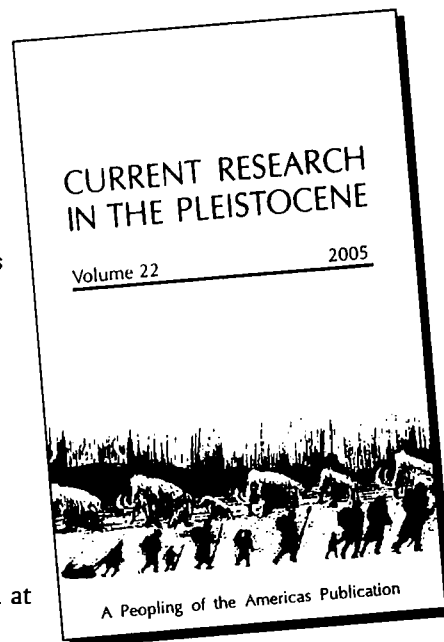
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