



# MAMMOTH TRUMPET

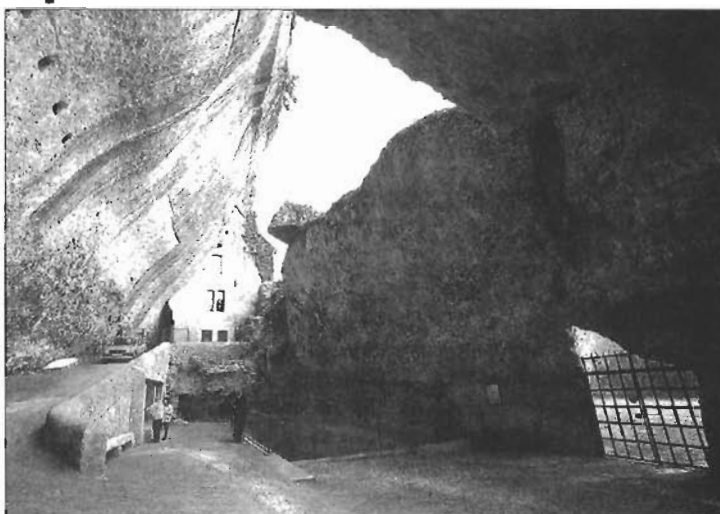
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Center for the Study of the First Americans  
355 Weniger Hall, Oregon State University  
Corvallis OR 97331-6510

## The Prehistoric Capital of the World

That's what the French call the cluster of caves and rockshelters in the Dordogne Valley east of Bordeaux. You can't blame them for bragging just a little. One of those caves at Le Moustier produced three complete Neanderthal skeletons and gave its name to the Mousterian culture. The shelter cave shown here is Laugerie Haute near Les Eyzies, which has continuous occupation levels dating back tens of thousands of years. The rock roof collapsed sometime in antiquity, creating the open-air look of today. Determined to stop the pillaging of artifacts, French authorities have tightened rules that apply to visitors.

Smithsonian photographer Chip Clark complains that this is the only "cave" he was allowed to photograph. "Nobody else would even let me near a cave with a camera." Clark accompanied Smithsonian archaeologist Dennis Stanford and lithics expert Bruce Bradley on their search of sites in France, Spain, and Portugal in 1997—a search for evidence to support their theory



CHIP CLARK, NMNH, SMITHSONIAN INST.

that the first Americans came from the Solutrean culture of western Europe, not from Asia. It's a controversial theory, downright heretical to Clovis classicists. What they say, though, makes a lot of sense—and they have evidence to support what they say. Read the story of their Solutrean migration theory on **page 11**.

**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 **Oregon State University**, promotes interdisciplinary scholarly dialogue among physical, biological and social scientists. The **Mammoth Trumpet**, news magazine of the **Center**, seeks to involve you in the late Pleistocene by reporting on developments in all pertinent sciences.

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## PLEISTOCENE LAKE LAHONTAN: FILLING IN MORE BLANKS

Anthropologist Amy Dansie has invested a good part of her life making sense of the environmental picture of Lake Lahontan and of the animals and people that walked its shores. In the Pleistocene and into the Holocene this was a land that teemed with life. Today it's an enormous dry lake bed in the Nevada desert. It has yielded startling discoveries in the past half century—Spirit Cave Man and Wizards Beach Man are the most famous—but it doesn't give up the secrets of its past easily.

Dansie and collaborator Jerry Jerrems chronicle the checkered history of scientific inquiry into Lake Lahontan in their report, "More Bits and Pieces: A New Look at Lahontan Chronology and Human Occupation," soon to be published along with the works of other authors in the CSFA book tentatively titled *Clovis and Beyond Proceedings: Where We Were, Where We Are, and Where We Are Going*. Their report, a bold undertaking, reviews the attempts, starting in the 19th century, to chart changes in water level in the lake over time and the corresponding effect on animal and human populations. "More Bits and Pieces" then integrates the results of recent research, including C. Vance Haynes's Clovis Drought model and newly determined dates of major climatic events like the Younger Dryas. The result is a comprehensive summary of our

understanding of Lake Lahontan at the start of the 21st century.

Excerpts from Dansie and Jerrems's report follow below. We have deleted bibliographic references and detailed diagrams that characterize the writing of every careful scientist.

### More Bits and Pieces: A New Look at Lahontan Chronology and Human Occupation

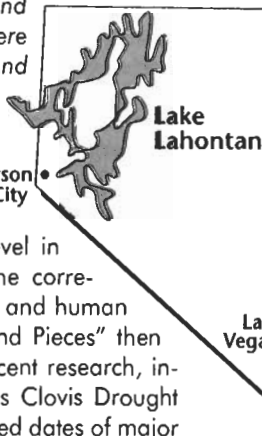
"Standing on the salt encrusted floor of the old lake and looking toward terraced hills, it does not take much imagination to picture the body of water that must have been here, even though it has taken tremendous imagination to work out the history of the lake that carved those terraces."

—Donald K. Grayson

#### Introduction

Lake Lahontan was a vast, mountain-rimmed, fresh-water Pleistocene lake in the north-western Great Basin, with a large island featuring a high-stand grassland refugium. It was about 900 feet deep at Pyramid Lake (274 m), inundating 8,665 square miles (22,442 km<sup>2</sup>) when it reached its high stand at an elevation of 4390 ft (1338 m) above sea level at 13,070 RCYBP. In this land of internal drainage, six separate

rivers flow toward a central series of basins,  
*continued on page 2*



## INSIDE

### 4 Buried puzzles

*Why did flintknappers go to the trouble to collect toolstone and create from it weapons and tools—some of them magnificent—then bury them? An avocationalist from Idaho earned his master's from an English university by rigorous research into lithic caches.*

### 11 The un-Bering Route

*Twenty, even ten years ago it would have been blasphemy to suggest the first Americans arrived not on foot but by boat—and on the Atlantic coast. Today two respected authorities are proposing exactly that theory, and even their doubters admit they make a lot of sense.*

### 18 The energy that drives Bits and Pieces



*A profile of Amy Dansie, whose backyard is Lake Lahontan. (That's Pyramid Lake in the distance.)*



each of which is unique in elevation and morphology. The basins are connected at sills of widely varying elevation, resulting in complicated hydrology on a vast scale. Lahontan chronology is vital to an interpretation of archaeological and paleontological contexts in the western Great Basin, due to the rapidly changing environments throughout the Terminal Pleistocene and Early Holocene. Such changes affected human subsistence and settlement decisions, and, equally important, the geological preservation of the evidence. We focus on the period of early human occupation, trying to understand the landscapes of northwestern Nevada from 14,000 to 8,000 RCYBP. . . .

### Continental Paleohydrological Models

Rapid environmental change at the Pleistocene-Holocene transition is becoming increasingly well documented, and its impact on humans was undoubtedly significant. The method of continental climatic

tions. Climate change and lake level fluctuations before Clovis times also may have affected humans, so it is important to include at least the last 14,000 years in lake history and archaeology.

Problems with radiocarbon dating made correlations of Great Basin lakes with phases of global climate change difficult. We structure our discussion around the radiocarbon dated climate phases as presented in Fiedel (1999) and present all our results in uncalibrated radiocarbon years (RCYBP). If the correlation with calendar years is ever resolved, these data can be stretched to fit the new calibrations. . . .

We combine Haynes's geoarchaeological interpretations with Fiedel's radiocarbon/calendar correlations for the following discussion. Briefly, this model states that the last full glacial conditions terminated abruptly at the onset of the Bölling/Allerød climate phase at 12,600

RCYBP, when temperatures rose sharply and "catastrophic ablation" of the great ice sheets began. According to Haynes, severe drought marked the Allerød, with a brief interval called the Intra Allerød Cold Period (IACP) 11,360 to 11,100 RCYBP ameliorating the drought somewhat. The terminal Allerød, 11,000 years ago, was marked by even greater drying, the "Clovis Drought." Clovis people confronted the dry Allerød climate conditions, when people and mammoths dug wells in desiccated spring ponds in the Plains and Southwest both before and after the IACP.

At 10,970 there was a sudden return to glacial climate. This was marked by a catastrophic deep freeze, followed immediately by increased moisture and continued cold climate for the next 800 RCYBP years (1300 calendar years): the Younger Dryas. The initial cold snap probably froze the last remaining surface water,

### We need good stories. And writers to tell them.

We want to hear from people with stories—or just leads—for articles in future issues. If you're on to a development in archaeology, anthropology, paleontology, or in any discipline that will further our understanding of the peopling of the Americas, we want to hear from you. Write or e-mail Rob Bonnicksen or me.

—Jim Chandler

correlation promises to help us understand the question of early human cultures and adaptations in the New World. The Great Basin is theoretically ideal for studies of climate change because all the precipitation is captured in the closed basins and directly reflects the prevailing effective moisture over a large portion of the continent. Lake recessions and transgressions during the early human occupation period in the Great Basin were particularly important because of growing evidence of a severe drought during Clovis times. Was there a Clovis Drought in the Great Basin? Many previous models show deeper lake levels during this time period, which would preclude early human occupation in the lowest eleva-



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Robson Bonnicksen

Director and General Editor

James M. Chandler

Editor, **Mammoth Trumpet**

e-mail: wordsmiths@acadia.net

Bradley T. Lepper

Editor, **Current Research in the Pleistocene**

Alice L. Hall

Office Manager

C & C Wordsmiths

Layout and Design

World Wide Web site

<http://www.peak.org/csfa/csfa.html>

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and Haynes reports that no mammoths or Clovis artifacts are found above (after) this event. Immediately above the last mammoth bones in the dried spring ponds is a black mat representing algal growth in the recharged springs. This pattern has been observed by Haynes in many parts of the continent, although Holliday has another interpretation. Wildly varying climate during the Younger Dryas may have produced mixed signals in the geological record. Just as suddenly as it started, the Younger Dryas abruptly ended at 10,100 RCYBP.

If there were a "Clovis Drought" in western Nevada, was there also a "black mat" episode reflecting sudden onset of increased moisture? Such extreme climate reversals should have left their mark in the Lahontan basin, but is there any evidence?

### The Quest for a Lahontan Chronological Model

Israel C. Russell [in] 1885 described ancient Lake Lahontan in detail, including a complex series of well-preserved geomorphic features such as beach terraces, gravel bars, deltas, calcium carbonate deposits (tufa), and lake sediments. The basic stratigraphic and paleontological sequence of the Pleistocene was known in general outline by Russell's time. He saw a correlation between the massive lake and the "Glacial epoch," but was unaware of any way to estimate its age. Lacking a means of chronological control, Russell estimated that the final recession of this now-dry lake happened 300 years before his studies, based on the extraordinary preservation of the lake features.

Beginning in the 1920s, Ernst Antevs provided a New World climate chronology, based on Old World lake varves that served as the primary basis for archaeological and geochronological interpretations in North America until well after the advent of radiocarbon dating. Antevs was also one of the first to develop a Lake Lahontan model based on his field work and his climate model. Antevs defined the post-glacial Neothermal as a sequence of major temperature regimes: the Anathermal, a time of rising temperature 10,150 to 7,000 B.P. [varv]; the Altithermal or "long Drought," a time of maximum temperature, 7,000 to 4500 B.P. [varv]; and the Medithermal, moderate temperature, from 4,500 [varv] to the present. He adjusted the timing of the Altithermal to 7500 to 4000 [varv] in 1955, but his original dates were probably more accurate. Except for these varve-based dates of Antevs, all dates cited herein are in uncalibrated radiocarbon years before present (RCYBP).

Heizer was the first Great Basin archaeologist to explore the timing of Lake Lahontan's demise in relation to human occupation, starting with Antevs's chronology and applying some of the first radiocarbon dates ever run by Libby. Heizer correlated the oldest cultural materials (Humboldt Culture in the caves, Granite Point Culture on the shorelines) with Anathermal lakes of 3950 feet (1204 m) in the Humboldt Sink, noting that the lakes had never been as high since. Heizer also noted that dry dates resting on lake deposits in both the Lahontan and Bonneville basins (11,199 ± 570 RCYBP, C-599, at Leonard Rockshelter and 11,151 ± 570 RCYBP at Danger Cave) were important correlations documenting the pluvial lake recessions. He said little about the earlier Danger Cave sheep dung date of 11,453 ± 600 RCYBP. The 1950s Great Basin pluvial lake model with which archaeologists were most familiar was of a gradually declining

high stand through 7,000 B.P. The related assumption was that lake levels around 3950 ft (1204 m) in the Humboldt sink must have been Anathermal in age (after 10,150 B.P. according to Antevs). These new radiocarbon dates were beginning to push the possibility of human occupations on the lower shore lines back to 11,500 to 11,200 B.P., and Heizer spoke of possibly finding "Pre-Anathermal man" in the Lahontan basin. . . .

### Tufa and Stratigraphic Chronologies


Early efforts to establish a radiocarbon-dated Lahontan chronology began with Phil Orr's "Operation Tufa" in 1954. His explorations of tufa caves at Winnemucca Lake, Nevada, revealed compelling evidence of Pleistocene human occupation associated with extinct horse bones and camel teeth in Level 4 of Fishbone Cave. We have scrutinized these claims and re-dated critical specimens; and discuss them below. Orr reported radiocarbon dates of 11,555 ± 500, 10,900 ± 300, and 11,200 ± 250 RCYBP (L-245) on wood from Level 4 of Fishbone Cave. He *implied* one of these dates was on twined shredded bark matting associated with a burial, which resulted in serious confusion in the archaeological literature ever since. Orr was aware his first dry dates were similar to the Leonard Rockshelter and Danger Cave dates noted above, all around 11,200 RCYBP. He did not like the 11,555 ± 500 date, re-dating until he was satisfied with the L-245 published date of 11,200 ± 250 RCYBP.

*continued on page 17*

## Article Questioning Radiocarbon-dating Accuracy Draws Fire from Scientists

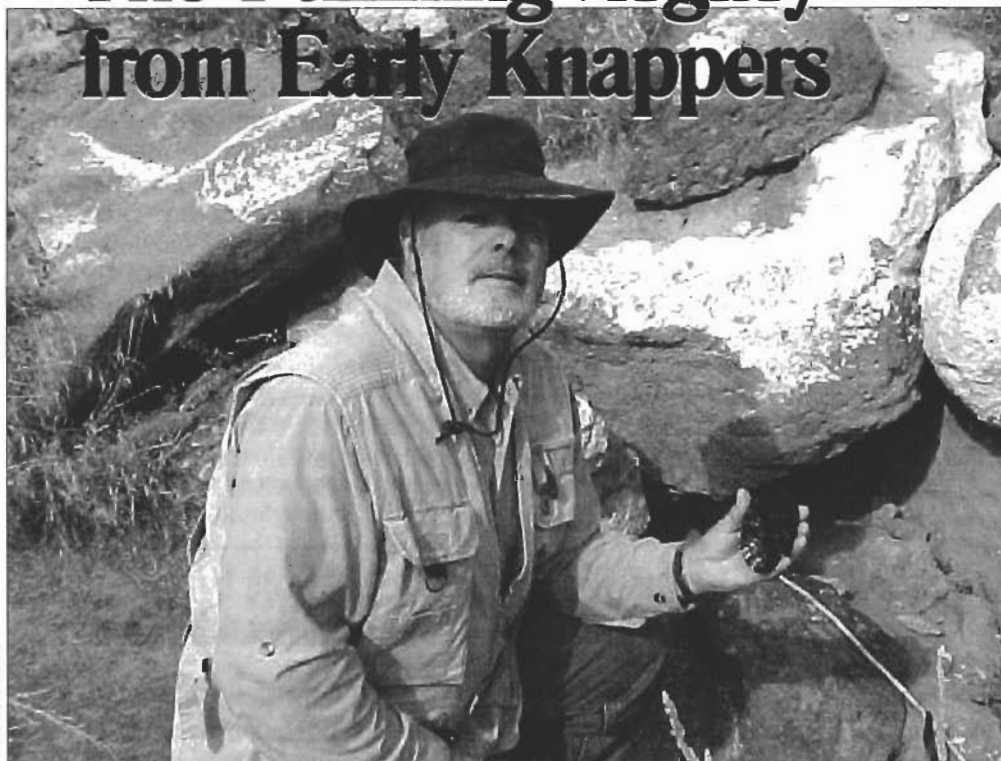
When we published "Terrestrial Evidence of a Nuclear Catastrophe in Paleoindian Times" (MT 16-2) by Richard Firestone and William Topping, we knew it was an article that was sure to create controversy in the scientific community. They theorize that C-14 levels in carboniferous materials, by which the age of organisms and artifacts is measured, are grossly misleading, the result of neutron bombardment from a supernova in Pleistocene times that "reset the radioactive clock." To challenge the accuracy of radiocarbon dating strikes at the vitals of many Earth sciences.

**Mammoth Trumpet** has received a rebuttal to Firestone and Topping's article from two respected authorities on radiocarbon dating: John R. Southon, Center for Accelerator Mass Spectrometry, Lawrence Livermore National Laboratory; and R. E. Taylor, Radiocarbon Laboratory, Department of Anthropology, Institute of Geophysics and Planetary Physics, University of California-Riverside.

It is our responsibility to publish opposing views. Our readers can best judge the merits of both arguments, however, if Southon and Taylor's rebuttal is published simultaneously with Firestone and Topping's response. Since there wasn't time for Firestone and Topping to respond in this issue of **Mammoth Trumpet**, we have deferred printing rebuttal and response until the March issue (MT 17-2). For the sake of fairness, we have asked Firestone and Topping to limit their response to the same length as Southon and Taylor's rebuttal. 

# LITHIC CACHES

## The Puzzling Legacy from Early Knappers



Steve Kohntopp at the Cedar Draw Cache site northwest of Twin Falls. He's holding a replica of a biface of ignimbrite, also called welded tuff, knapped by James Woods, director of the Herrett Center for Arts and Science at the College of Southern Idaho.

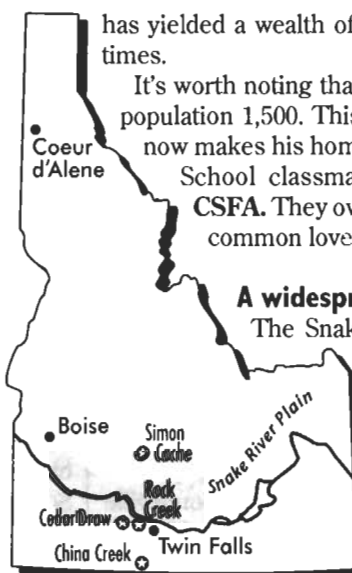
**C**ACHES DON'T COME in a standard package. The typical cache is an assortment of roughed-out preforms, quarried toolstone with a minimum of work invested, found piled near a stream or shelter with southern exposure. Sometimes, though, a cache is found that's a collection of exquisitely finished projectile points and tools, splendid examples of the craftsman's art. Another may contain lithic tools in various stages of reduction, what you might imagine an illustration from a flintknapper's instruction manual would look like.

What all caches have in common, regardless of their components, is that the artisan buried them. Archaeologists have speculated about the reasons for burial. Some caches appear to be votive offerings. Others may be storehouses of material for future use. Theorists suspect that some buried artifacts are imbued with mystical significance. It was the diversity of theories surrounding caches that persuaded Steve Kohntopp to choose this rich field as the subject of the thesis he wrote to earn his master's from the University of Leicester in England.

Kohntopp doesn't have to travel far to do field work. He's a successful realtor in Twin Falls, Idaho, a town of 34,000 perched on the edge of the Snake River Canyon. The Snake River Plain

has yielded a wealth of artifacts dating from Clovis to historic times.

It's worth noting that just 8 miles from Twin Falls lies Filer, population 1,500. This is where he was born and raised and now makes his home on a nearby family farm. A Filer High School classmate was Rob Bonnicksen, director of CSFA. They owe their long-standing friendship to their common love of ancient history.



### A widespread curiosity

The Snake River Plain certainly doesn't have a monopoly on caches. Ancient cultures in Australia, Neanderthals in Europe, and their successors, the Solutreans of France and Spain (see "Immigrants from the *Other Side*?" in this issue), all satisfied what appears to be a universal human impulse to secrete lithic tools for whatever reason. In North

America the most famous caches are those of the Clovis period. These include the Fenn Cache, discovered in 1902 near the three corners of Idaho, Wyoming, and Utah, a stunning assemblage of more than 50 oversize projectile points, preforms, and



tools; the Anzick Cache, discovered in 1968 near Wilsal, Montana, containing more than 100 artifacts including Clovis points and bifaces; the Drake Cache, discovered in 1978 in north-central Colorado, consisting of about a dozen spear points and ivory fragments of finished projectile points; and the Roberts-Richey Cache, discovered in 1987 near East Wenatchee, Washington, containing 14 Clovis points (oversize specimens as if made to show and not for use, a recurring characteristic of cache artifacts), nearly 50 bifaces and scrapers, and a decorated bone tool.

In his superbly researched thesis, Kohntopp discusses these Clovis caches and caches of more recent cultures in his search for motives that explain why a knapper would bury the product of his labor. For detailed analysis of cache assemblages, however, he chose sites close to home—almost in his backyard—in the Snake River Plain.

### High, rough country

The country of the Snake River Plain is a desert plateau at an elevation of about 3,500 ft. Where the land isn't farmed, the common vegetation is *Artemisia tridentata*—big sagebrush. [My wife assures me that, for once, my memory hasn't failed me. When we drove through here many years ago, I recall seeing a sign erected by a local wit: THAT ISN'T SAGEBRUSH. THAT'S IDAHO CLOVER. JMC.] This is country that figures prominently in American history. The Snake River was a leg of the Oregon Trail and a formidable obstacle to pioneers, as described in gut-

is a visible remnant of Lake Bonneville.) Water-tumbled and -polished boulders, "Bonneville eggs," attest to the water's fury; Kohntopp keeps a small one on his desk. In a separate episode, the Cordilleran Ice Sheet blocked the Clark Ford River at the extreme north of Idaho, creating a lake with an estimated volume of 300 cubic miles. When the dam burst, all that water thundered out and emptied the lake—probably in just a few days. The torrent gouged out valleys and strewn boulders 35 feet high across hundreds of miles of the Columbia Plateau.

North of the Snake River Plain, beyond the 6,800-foot Mount Bennett Hills, lies the Big Camas Prairie, elevation 5,000 ft. The final stage in the accumulation of alluvium continuously deposited since the middle or late Pleistocene (estimated at 500 to 1,000 ft deep and, except for the uppermost few feet, completely saturated), this plain was an important harvesting ground and meeting place for early Americans, who depended on the sweet tuber of the camas, or quamash, as a staple in their diet. (When white settlers plowed under the camas fields in 1878, it caused an uprising by the Bannock Tribe, normally a peace-loving people, who were subsisting on a per capita food allowance of 2½ cents a day.)

### The Simon Cache, a showcase of Clovis lithic tools

For Kohntopp, the Big Camas Prairie was pivotal in his research because Clovis people lived here and left their imprint, the Simon Cache, a collection of 33 bifaces, a scraper, and a spall discovered in 1961. (There was some initial confusion about the precise number of artifacts. Several tools were later found to be fragments of one tool that was shattered by earth-moving equipment operated by William D. Simon, for whom the site is named.) The Simon Cache cannot be precisely dated, since there were no organic remains and all the artifacts are made of non-local materials—none of it obsidian, which can be dated by hydration age dating. Other sites, however, put human occupation in this area at 10,000–11,000 RCYBP, within the window of 10,900–11,200 RCYBP, the generally accepted period of the Clovis culture in North America. The assemblage is remarkable in several respects. The



Shoshone Falls, shot in 1932 by pioneer photographer Clarence Bisbee (a glass negative accounts for the scratches). Idaho is currently experiencing a severe drought; since most of the flow of the Snake River is diverted for irrigation, the Falls today are a mere trickle. In the Pleistocene, this was not a land for the faint of heart.

wrenching detail by A. B. Guthrie, Jr. in his Pulitzer Prize-winning novel, *The Way West*.

The country of the existing Snake River Plain wasn't treated gently during the Ice Age. Idaho lay at the extreme limit of the Cordilleran Ice Sheet, and during the Pleistocene-Holocene transition enormous amounts of meltwater wrought massive changes to the land. When Pleistocene Lake Bonneville broke over its banks 14,000 to 15,000 years ago, the great Bonneville Flood carved out the 450-foot-deep Snake River Canyon, geologists believe in a matter of months. (The Great Salt Lake in Utah

most obvious is the wide range of the tools in both size and stage of lithic reduction. Partially completed bifaces range in length from about 4 in (about 10 cm) to a giant nearly 8 in. Using intuitive criteria developed by Sharrock for defining five stages of biface completion based on such factors as overall symmetry, margin morphology, and width-to-thickness ratio, the lithic tools of the Simon Cache span the entire range.

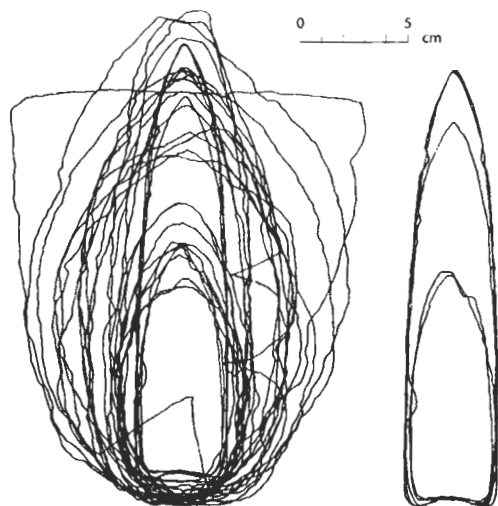
The extraordinary skill of the knappers is evident in the five finished points, which also vary remarkably in size (see photo). It appears from at least one specimen that the craftsman, having

The five finished points of the Simon Cache assemblage. Clovis knappers are famous for the thinness of their blades; the artist who created these delicate masterpieces pushed the technology to its limit. The point on the extreme left is 7.4 in long, yet only 0.3 in thick—the thickness of an ordinary pencil.

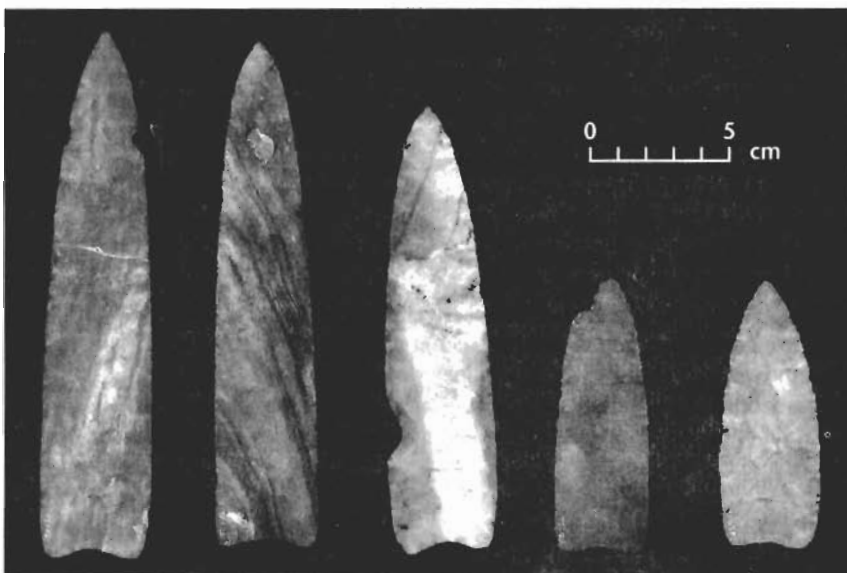
shaped and thinned the biface, painstakingly ground the entire margin smooth, then carefully pressure-flaked to sharpen the edges—except near the base, which he intentionally left dull to protect the sinew or other material that would be used to haft the point. In fact, the basal margins of all five points have been ground for improved hafting, even though it must have been obvious to the knapper that the longest points, while undeniably magnificent, were too fragile to be practical. The artisan who made these points was a perfectionist. We can only guess why. Is it because of pride of workmanship? Or is it because he was creating a sacred token? These are the kinds of questions Kohntopp treats in his thesis.

Kohntopp notes that all the Simon Cache artifacts are made of non-local material, including red jasper that has been traced to the Big Horn Basin Mountains in northern Wyoming, 350 miles distant. According to University of Arizona geoarchaeologist C. Vance Haynes, Jr., one of the bifaces may be made of Alibates chert from the Texas Panhandle! It appears likely that long-distance travel and possibly trade figured in the life of these early people.

What else can we tell about the Simon Cache? Since none of the artifacts shows wear, they obviously weren't worn out and discarded. There were no animal skeletal remains, which means it wasn't a kill site. The cache was found 30–46 cm (about 12–18 in) below the surface within an area about 5½ m (about 16½ ft) in diameter; the ground on which the artifacts lay and the artifacts themselves were stained with red ocher.



Outline drawings of the entire Simon Cache assemblage (left), and only the five finished points (right) show the unusually wide range of sizes of the components.



STEVE KOHNTOPP

Ocher (iron oxide) was used by primitive people around the world as a pigment in rituals, especially in human burials. It is not, however, an invariable indicator of ritual or ceremony; authorities Gene Titmus and James Woods believe ocher may also have been used as a polishing agent by ancient knappers, like jeweler's rouge today. Since no human remains were found in association with the artifacts, it's uncertain that the Simon cache was a mortuary site.

### The why of caches

The Simon family donated the collection to the Herrett Center for Arts and Sciences at the College of Southern Idaho in Twin Falls. Director James Woods, who has been Kohntopp's mentor over the years, suggested caches when it came time for him to choose a subject for his thesis. Woods told him the Herrett Center receives many inquiries about caches, especially from graduate students. "There had been isolated papers written on caches," Kohntopp recalls, "but no one ever tried to put them together. That's what I attempted to do in my thesis, at least for this region." He made a bold effort to consolidate all known theories on caching. Previous researchers had never included more than four theories in a paper; Kohntopp's thesis discusses ten or so motives for caching. Of course, unsubstantiated speculation would have been unacceptable to his thesis director. The University of Leicester demands solid scientific research and sound scholarship. Kohntopp, after a great deal of work—probably, he admits, the hardest of his life—gave them both.

Here are some of his significant findings that illuminate the caches we find today and the possible motives of the people who buried them thousands of years ago.

**Toolstone storage** Archaeologists Dennis Stanford and Bruce Bradley call biface caching "a strategy for optimizing raw materials." Knappers prepared blanks at the quarry site, forming them roughly to size to reduce the weight they had to carry, and deposited the blanks—spare parts—along hunting or trading routes. We know knappers prized fine toolmaking material. Even with adequate material available nearby, they would travel great distances to obtain stone of the finest quality or with special coloration that might give a magical boost to their hunt-

ing skill. Of 13 projectiles found in the Drake Cache, for example, 11 were made from Texas Alibates dolomite that had been transported 350 miles. At the Wamsutta site in Massachusetts, the excavation team has found artifacts made of flow-banded rhyolite from Mt. Jasper in New Hampshire, almost 200 miles north ("On the Shore of a Pleistocene Lake," MT 16-1).

How do we explain why we find toolstone caches today apparently untouched? Perhaps, Kohntopp conjectures, they were simply abandoned and forgotten. Or perhaps the buriers were forced to migrate because of climate changes, overpopulation, depletion of food resources, or intrusion by hostile competitors.

**Safekeeping** A craftsman, having invested considerable effort in knapping finished tools as spares to replace broken or lost ones, would be understandably reluctant to risk losing the kit to a roving band of hunter-gatherers. The obvious solution is to hide them underground. To explain why we find a cache of finished tools untouched, Kohntopp offers the same reasons as for toolstone caches, besides an additional possibility: perhaps the craftsman hid the valuable tools so well he couldn't find them himself.

**Human burial** Fossil evidence shows that when Neanderthals laid their dead to rest, they took care to provide food and implements for use by the departed in the afterlife. This practice is common among primitive people the world over. Archaeologists George Frison and Bruce Bradley believe lithic caches were tributes to the dead at burial sites. M. G. Pavesic, who has studied burial sites, finds that most are located on a rise or crest of a hill and are associated with red ocher, Olivella shell beads, abnormally large stone artifacts, and human remains.

Osteological evidence can of course be interpreted as *prima facie* proof of the cache as tribute to the dead. But even in the absence of human bones we cannot discount the possibility that the cache is a cenotaph, constructed to honor the memory of a revered leader either buried elsewhere or whose body wasn't available for burial. Pavesic and G. R. Muto suggest that semi-

finished tools in various stages of lithic reduction, like those of the Simon Cache, were intended for use by the deceased in the afterlife, with finished tools serving as examples of what the final product should look like—in other words, a do-it-yourself survival kit for the celestial traveler.

**Storage of trade goods** Toolstone and finished tools quite possibly became currency in trade, or a group may have held the goods of another as collateral until some kind of debt was repaid. A cache was the primitive analog of today's bank.



JAMES W. HENDERSON

A corollary to the idea of lithic tools as a medium of exchange is that, in a commercial society, prestige becomes important. In order to bolster their position among trade

**A crystal quartz biface from the Simon Cache. It's easy to see why a Paleoamerican hunter would expect a boost from its magical properties.**

rivals—"earn their bragging rights," we would say today—a group might create what J. A. Brown calls "status-conferring objects," exotic and impressive artifacts. Oversize points like those in the Simon Cache, spectacular examples of flintknapping skill but useless as tools, belong in this category.

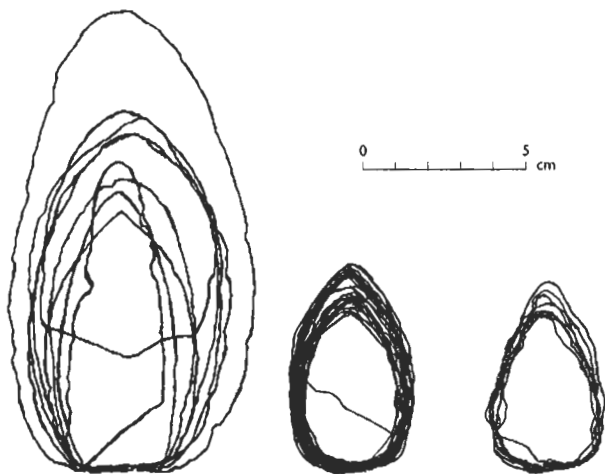
**Religious offering or symbolic token** Gods need to be impressed, just as trading rivals do, and occasionally appeased besides. Kohntopp observes that four of the biface blanks in the Simon Cache are quartz, which, according to B. M. Fagan, was prized by shamans, who believed it was inhabited by spirits whose supernatural powers could be tapped by breaking open the stone. C. G. Yeager and J. L. Gibson find that quartz was valued as an ornament and for ceremonies.

Kohntopp cites Chris Henshilwood, chief excavator of the Blombos Cave on the South African coast, who interprets ocher markings in the cave as symbolic motifs. To him it is significant that ancient craftsmen, ignoring local quartzite, traveled 10 to 20 miles to obtain exotic toolstone. "It was unnecessary," Henshilwood maintains, "to produce an item of this standard simply so it could be thrown at an animal."

Kohntopp applies the same reasoning to the Simon Cache, which he finds

too exquisite to be a utilitarian cache. The large size of the artifacts, the selection of rare tool stone, the presence of red ochre, and the skill of the artificers indicate the Simon Cache was of high significance to the Clovis people. If a high value was attributed to the cache, it is likely that its location was restricted to a selected few individuals, and that the cache was hidden in an unlikely place never to be retrieved.

**Underwater votive offering** The desire to sacrifice valuable objects to deities that inhabit murky depths is a universal human urge. Today we toss coins into fountains. Mesolithic people in southern Scandinavia pitched exotic materials into the waters, and Neolithic people of Brittany heaved polished stone axes.



STEVE KOHNTOPP AFTER WOODS AND TITMUS

**Outline drawings of the components (left-right) of the China Creek Cache, Rock Creek Cache, and Cedar Draw Cache.**





The DeMoss site, discovered in 1985 in the Meadow Valley of Idaho about 85 miles due north of Boise, suggests the practice may have continued in North America. The site, identified as a Cascade Phase burial site, contains the remains of more than 20 individuals of various ages, which have been radiocarbon-dated to 6000 calendar years old, together with more than 200 burial blades and projectile points. The remains and artifacts were recovered from a boggy spring 7 ft deep, leading us to suspect the dead, with their tools of survival, may have been consigned to whatever fate awaited them in the depths of the spring.

The association of caches with water leads to another possible explanation for the origin of the Simon Cache. Marvin B. Strobe, former professor of geology at the College of Southern Idaho, believes the pluvial lakes of the Pleistocene in southern Idaho didn't start to dry up until about 10,000 years ago. If the pluvial lake that covered the Big Camas Prairie was extant during the Clovis period, it's possible the artifacts of the Simon Cache were a watery offering. That, in turn, raises an intriguing question: Did Clovis people know how to make and use watercraft? Smithsonian archaeologist Pegi Jodry believes they did, and she has intensified her search for evidence to prove it.

### Other Snake River Plain caches

The Simon Cache, being of Clovis age and the most famous cache—and the most enigmatic—in the Snake River Plain, receives the most attention in Kohntopp's thesis. He decided for the sake of comprehension to discuss three other caches besides. Two of them proved to be more interesting than he expected.

**Rock Creek Cache** Rock Creek is the last tributary of the Snake River open to freshwater-spawning fish below the impassable Shoshone Falls, which lies a few miles upstream and only about a mile from Twin Falls. In 1982, while conducting an archaeological survey for an engineering firm contracted to build a large hydroelectric facility, anthropologists James Woods of the Herrett Center and Mark Plew of Boise State University discovered a cache on a terrace above the prehistoric Snake River channel near the confluence of Rock Creek and the Snake River. Initial occupation of Rock Creek is estimated at about 10,500 years ago.

Four test pits yielded over 1,500 pieces of debitage and 62

Looking east from the bottom of the Snake River Canyon (now dry) at a spot upriver from the Rock Creek Cache. Around the canyon the terrain is flat to sloping, very different from the canyon itself.

artifacts, including 32 bifaces of ignimbrite, a local variety of obsidian. All the bifaces are black except three of reddish brown color. Woods and Dr. Plew describe them as generally ovate in form, with relatively thin cross sections and straight margins viewed laterally. They were apparently produced entirely by percussion flaking. None shows damage or use-wear. It's fortunate that the points are made of ignimbrite, a particularly archaeologist-friendly material. Not only can it be dated using hydration age like other obsidians, it also has a fingerprint. Chemical analysis can trace it to the volcanic glass flow from which it was quarried. Tests done on the Rock Creek Cache

points show they were made  $2873 \pm 181$  calendar years ago from an ignimbrite source about 30 miles south near an area called Browns Bench. Since the date coincides with the period when Elko points were prevalent, the cache of bifaces may have been intended for production of those points. Nearby Woods and Plew found side-notched, Rose Spring, and Cottonwood points associated with ceramic artifacts, which may be contemporaneous with another site radiocarbon dated between 300 and 800 calendar years ago.

**Cedar Draw Cache** Discovered in 1986 on the bank of the Cedar Draw stream northwest of Filer by a worker on a hydroelectric diversion dam, the Cedar Draw Cache consists of a scraper and nine ovate bifaces of ignimbrite that appear to be preforms. Visible cortex on two of them suggests use of a core-flake technology in their manufacture. It appears the ignimbrite came from the same quarry site as the Rock Creek Cache artifacts. Kohntopp has received permission from the finder to test the objects to determine their age and to verify the source of the material, and he is now preparing the cache for shipment to a lab.

It's hard to imagine artifacts more different from the beautifully crafted points of the Simon Cache than the Cedar Draw Cache preforms. They appear to be the work of either a beginner or an experienced knapper in a hurry. Most of them show step and hinge fractures. A misdirected blow created a deep indentation that nearly fractured one biface. In some cases the knapper removed flakes so large they almost cross from one margin to the other—*outré passé*, or overshot flaking, a mistake committed by clumsy knappers that was developed into an art form by Clovis masters.



Paradoxically, all the points are remarkably uniform in size and shape. It appears the entire assemblage was made in a single session by one knapper, skilled but sloppy, for the purpose of creating blank preforms for a specific kind of projectile point.

**China Creek Cache** In 1982 Joan Fay discovered a cache at the confluence of China Creek and Salmon Falls Creek near the headwaters of Salmon Dam Reservoir, in the area called Browns Bench (the source of the ignimbrite from which the Rock Creek Cache assemblage was made). An irrigation dam floods the site during the growing season. The site is located on a low slope; according to Gary Fay, it's the only good crossing across the

Salmon Falls Canyon for several miles and may have been a major migratory path for Paleoamericans.

Over the course of about a week the Fays found seven biface blanks within an area about 18 ft in diameter. All are made of translucent chalcedony of various colors. The curious aspect of the artifacts is their orientation—all were found pointing either to the southeast or southwest; three were layered one atop the other, a white blank sandwiched between two of moss color—suggesting there may be mystical significance in the way they were placed. Found clustered nearby were a broken biface blank, a small scraper, and a biface resembling a lanceolate point. Although it hasn't been proved that these objects are part of the cache of seven bifaces, Kohntopp elected to include them in his analysis of the China Creek Cache.

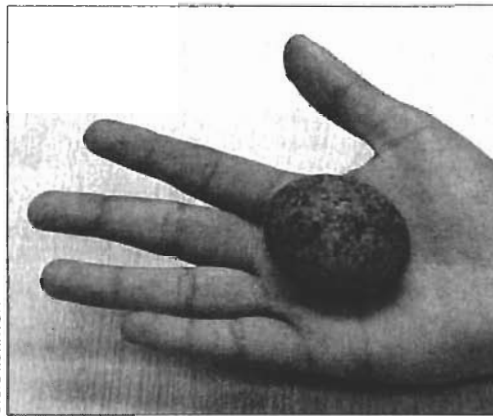
Except for the lanceolate point, all the components of the China Creek Cache show the same kinds of minor manufacturing flaws; like the Cedar Draw Cache assemblage, the entire collection of the China Creek Cache seems to have been made by one knapper in a single event. The striking feature of the artifacts isn't the workmanship so much as the variety of colors of the materials. Once again we see evidence of the considerable effort knappers frequently spent in selecting toolstone. (Kohntopp notes that artifacts found at the Puntutjarpa Rockshelter in the Western Desert of Australia are made of non-local chert, even though superior stone was plentiful nearby.) Some of the Simon Cache bifaces are made of fine chert imported from the Cannonball Mountains about 12 miles north of the site. It may be the same quarry that supplied materials for the China Creek Cache (in this case, a distance of about 60 miles), although the source cannot be verified without thoroughly investigating nearby quarries. The effort may be worth it: one of the China Creek Cache bifaces is made of nearly pure-white chert that Bonnichsen believes may have come from the Tosawihi Quarry near Winnemucca, Nevada—a distance of nearly 200 miles! Tracing the source of the toolstone may reveal some surprising answers.

### A roundabout journey to get here

Kohntopp readily admits he didn't see himself as a scholar of archaeology. He has been a realtor for most of the 30 years of his professional life and studied ancient history as a hobby. Four years ago he took courses at Idaho State University in Mayan and South American archeology taught by Woods, which further piqued his interest. He even entertained the notion of participating in digs around the world after his retirement. A 5-week dig at the ancient Mayan city of Nakbe in the Peten jungle of Guatemala was a reality shock. Working on site with trained archaeologists made him realize he lacked knowledge of fundamental concepts and the specialized vocabulary you need to communicate effectively. He came back from the trip, he remembers, "even more interested in archaeology and determined to learn more." Where to get the education was the problem. His business didn't leave him time for a full-time college course of study, and earning the 25 credits needed for a

degree in anthropology as a part-time student was a bleak prospect—ISU is a 2-hour drive from Twin Falls.

He found the answer in an ad in *Archaeology* magazine: earn your M.A. long-distance in archaeology and heritage from the University of Leicester. The 2-year course is designed specifically for the working student with a full-time job—in other words, for Steve Kohntopp. Education is through the traditional paper medium—books, rather than the Internet. The course consists of four 15-week modules; at the end of each module you are required to write three essays, a project paper, and a 15,000-word thesis on an approved topic.



**A Bonneville Egg, by-product of the violent birth of the Snake River Canyon. This one normally sits on Steve Kohntopp's desk. There are bigger ones—a lot bigger—in the canyon.**

Now Kohntopp is better equipped to hold his own in colloquy with trained archaeologists. Moreover, the "heritage" aspect of the course has prepared him to manage a museum or heritage site.

He's already putting his training to use. The Cedar Draw Cache and China Creek Cache are unpublished. Both are private collections that hopefully will be donated to the Herrett Center. Before Kohntopp started work on his thesis, only preliminary work had been done on the assemblages—Woods had finished the drawings on the Cedar Draw Cache, and Titmus had made some initial measurements. Kohntopp is continuing research on the Cedar Draw Cache, and he just submitted an article on the China Creek Cache for *Idaho Archaeologist*, the journal of the Idaho Archaeological Society.

Now Kohntopp is hotly pursuing his hypothesis that the Simon Cache may have been an underwater votive site. Recently Bill Bonnichsen (Rob Bonnichsen's brother), a geologist at the University of Idaho, visited the site and confirmed that the Big Camas Prairie is indeed an ancient lakebed. He informed Kohntopp of a Ph.D. thesis at the University of Washington that verifies the lake's existence. (Kohntopp has ordered a copy.) Rob Bonnichsen also believes soil stratigraphy reports may exist at the Idaho State University Museum in unpublished notes written by Earl Swanson, who made the last dig in 1968 (with Rob Bonnichsen in attendance). Kohntopp has e-mailed a request for access to the files. "The detective story continues," he reports.

And for the time being, he's still selling properties. 

—JMC

How to contact the principal of this article:

Steve Kohntopp  
Magic Valley Realty  
1286 Addison Avenue E.  
Twin Falls, ID 83301  
e-mail: [swk@fildertel.com](mailto:swk@fildertel.com)

## CLOVIS AND BEYOND

# "Kennewick Man and the Peopling of the Americas"

Symposium in association with the 18th Annual Marin Indian Art Show

Ever since the Kennewick Man was discovered in 1996 along the banks of the Columbia River, he has been the center of a storm of controversy and mystery. The mystery revolves around the Kennewick Man's identity. Where did he come from? To whom is he related, and why does he look different from modern Native Americans? The controversy concerns who has access and rights to the past. At stake are Native American religious beliefs and the right to conduct scientific investigation.

Because of recent scientific/technological breakthroughs scientists now have the means to learn a great deal about where K-man came from, who shares his genes, what his diet was, and whether he had any contact with diseases, etc. Efforts to make use of these new technologies and techniques, however, have been stymied by mounting governmental restrictions meant to protect Native American cultural relics and beliefs. In the K-man Case, a group of scientists have sued the Department of the Interior for the right to study one of the oldest (9,000 years old) and rarest remains of a Paleoamerican.

The case has captured the interest of the public and has generated discussions well beyond the realm of the scientific community. Television documentaries, several books and numerous high profile articles have all explored the impact of this pivotal case—especially in regard to how the Native American Protection and Repatriation Act (NAGPRA) will be interpreted and applied to Paleoamericans. The future of scientific inquiry concerning the peopling of the Americas and the public's ability to learn about our common cultural and biological heritage is in the balance. Several definitions are being challenged in the lawsuit: What is a "Native American"? How can cultural affiliation be determined? What constitutes cultural patrimony? The court's decisions regarding these questions will impact scientific inquiry and the field of First Americans Studies, as well as public access to knowledge about the past, for years to come.

The speakers at the symposium will discuss the Kennewick Man Case from the scientific perspective and review the latest advances in technology that allow First Americans Specialists to address emerging questions about the past prompted by the discovery of ancient remains such as K-man and Spirit Cave Man. Some of the technology to be covered will include the study of modern and ancient genetics (mitochondrial DNA), advances in radiocarbon 14 dating (accelerator mass spectrometry 14C dating techniques), and the use of powerful desktop computers to statistically analyze hundreds of measurements.

### Featured Speakers

**Rob Bonnicksen** First American specialist and lead plaintiff in Kennewick Man case

**Bradley Lepper** Archaeologist with the Ohio Historical Society in Columbus, OH

**Alan Schneider** Lead lawyer in scientists' case

For speakers' biographies and abstracts: [www.ClovisandBeyond.org](http://www.ClovisandBeyond.org)

### James Chatters's reconstruction of Kennewick Man



### Symposium

Friday, Feb. 22, 2002 7–10 P.M.  
Tickets \$20 Students \$10

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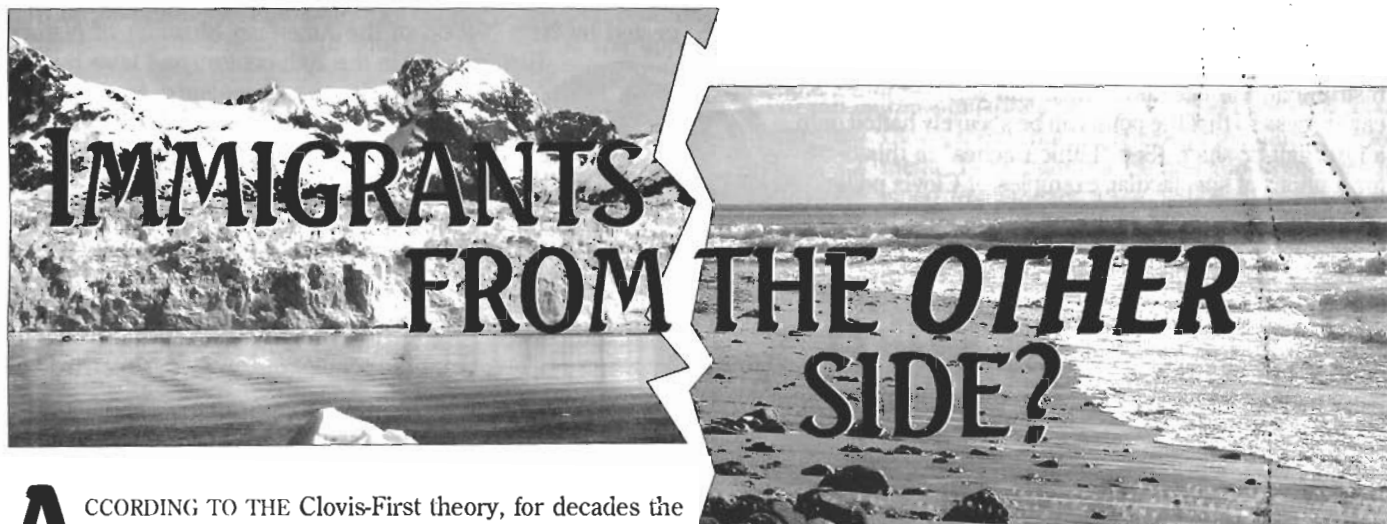
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### For Ticket Information and Map

[www.ClovisandBeyond.org](http://www.ClovisandBeyond.org)

[Kman@clovisandbeyond.org](mailto:Kman@clovisandbeyond.org)

Toll free: 877-587-2455



**A**CCORDING TO THE Clovis-First theory, for decades the gospel preached by authorities on the peopling of the Americas, the first Americans walked across the Bering Land Bridge from Asia about 12,000 years ago, and after finding a corridor through the Cordilleran Ice Sheet—admittedly it wasn't an easy trip and the timing was tricky—descended into temperate North America. We know them by their classic fluted points, unlike any others in the world, they left at campsites on their journey south to populate Central and South America.

There have been variations of the basic theory. The Greenberg hypothesis asserts that not one but three waves of Asian travelers crossed on foot, each founding a different linguistic family. Recently anthropologist C. Loring Brace of the University of Michigan revealed the results of his study, which postulates that two crossings, one on foot 15,000 years ago, the other by water 10,000 years later, gave rise to two linguistically unique peoples ("New Study," MT 16-4). *Asians* again.

Even before 1997, when a panel of authorities inspected the Monte Verde site in Chile and conceded that radiocarbon-dated evidence of human occupation predates the earliest Clovis sites in North America by 1,000 years (which makes it difficult to defend the theory of a north-to-south population movement), Smithsonian archaeologist Dennis Stanford was looking in a different direction for the origin of the first people that entered America. He was looking not west to Asia, but east to Europe.

### Dropping a cold trail for a warmer one

Dr. Stanford is no maverick. His mentors were luminaries in American peopling studies: the late Marie Wormington, Curator of Archaeology at the Denver Museum of Natural History for 31 years and author of classic texts on early Americans, whose seminal field work in the Southwest in the 1930s shaped the

practice for those who followed her; and C. Vance Haynes, Jr. of the University of Arizona, who probably more than any other person has defined the Clovis culture (and who today continues to reserve judgment on the validity of Tom Dillehay's purported pre-Clovis Monte Verde site). Stanford, for much of his professional life, was an enthusiastic Clovis-First advocate.

What made him turn away from the Bering route and look elsewhere for the first migration? His thinking evolved over three decades. In the '60s Stanford, like most of his colleagues, believed that Clovis came from Asia. It wasn't until the '70s that he began to believe that Clovis was a New World development and that evidence of pre-Clovis would be found in the Arctic. "But I wasn't seeing evidence," he recalls, "and after a while it started not to make sense. Everything I found in Alaska that was



◀ Dennis Stanford and Bruce Bradley at the Museum of Human Prehistory in Les Eyzies, France. The Museum buildings occupy a paleolithic occupation level in the cliffs 50 ft above the town.

▼ The collections manager at the Museum in Les Eyzies and Stanford compare casts of Clovis points with Solutrean points.



PHOTO: CHRIS CLARK, NATURE, SMITHSONIAN INSTITUTION

fluted was post-Clovis in age." There was no technology he considered pre-Clovis. He hoped at the time that once Siberia was opened up to Western scientists we would find the missing evidence. But the end of the Cold War didn't provide the solution for Stanford and his co-theorist, lithics expert Bruce Bradley. Stanford and Dr. Bradley independently looked at the evidence and arrived at the same conclusion. They in-

spected late-Pleistocene sites and scoured museum collections in Siberia, Russia, and northern China, seeking pre-Clovis technology. Instead, what they found was a totally different method of making tools and weapons.



The Clovis fluted point is knapped from stone, flaked on both sides (bifacial) and shaped into a beautiful thin, flat killing instrument; the base is thinned and relieved into a concave recess so that the point can be securely hafted onto a foreshaft or shaft. (See "Lithic Caches" in this issue for a photo of spectacular examples of Clovis points.)

The Asian upper-Paleolithic weapons that Stanford and Bradley found, however, were made using a microblade technology, where tiny blades struck from wedge-shaped pieces of stone were inset into long, narrow rods of bone, antler, or ivory. When Far East craftsmen tried to make bifacial tools, the result was relatively crude implements (quite thick in cross section, compared with exquisitely thin Clovis points) and frequently bi-pointed. Stanford and Bradley suspect the Asian bifaces were knives instead of projectile points.

True, they found assemblages containing bifaces and large blade cores. But those sites are in the Trans-Baikal region of central Asia—about 6,000 miles from Alaska—and date to 10,000 years before Clovis. To Bradley they appear to belong to the Streletskayan technology of the Eurasian Plain and not to the Far East.

Nowhere in Asia did Stanford and Bradley find the ancestor of the Clovis point. They reasoned that if the first immigrants were Asian, they must have brought with them their inset-microblade manufacturing process, in which case there must exist evidence of a transition to Clovis technology. So far, however, nothing resembling an intermediate form between inset microblades and a knapped biface has been found in North America.

Stuck at a dead end, Stanford and Bradley took up a fresh trail. The roots of Clovis, they reasoned, must lie in the Paleolithic Old World outside of Asia. They took up the search for a parent technology that specialized in making thin, flat bifacial projectile points, knives and other biface implements, and other artifacts of stone and bone similar to those of the Clovis

**Stanford tests the flaking characteristics of stone from the Solutrean-age quarry near Bergerac, France.**

culture. They didn't demand of the candidate that it precisely match Clovis technology, only that it exhibit features that could be reasonably interpreted as pre-Clovis. They found only one Paleolithic culture whose technology met their criteria, sug-

**Painting of a bison from a Solutrean cave at Altamira, Spain.**

**Carved ivory bird (penguin?) from the Asturias Regional Museum of Archeology in Oviedo, Spain.**



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gested by Nels Nelson of the American Museum of Natural History early in the 20th century and later by University of Arizona archaeologist Art Jelinek in an article published in 1971 in *Arctic Anthropology*: the Solutrean people. Named for the French town of Solutré, the culture spread across much of France and the Iberian Peninsula. Stanford and Bradley look to northern Spain and southwestern France for the people who might have carried pre-Clovis technology across the Atlantic.

### Newest members in a family with a long history

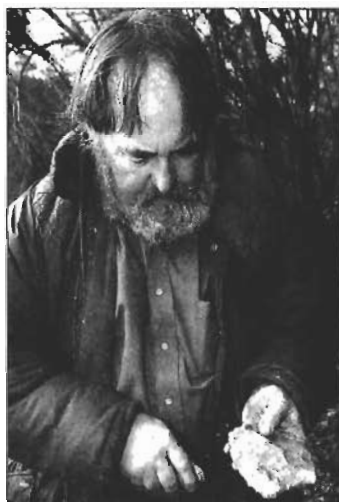
Whatever problems beset European archaeologists, they don't suffer from a dearth of evidence of early human occupations. The Mousterian culture of the Neanderthals, for example, has been traced back 250,000 years. The Neanderthals made tools of stone, some of them eye-catching even today, but they weren't innovators. For more than 100,000 years they continued to reproduce the same tools using the same pattern, never varying. Says French prehistorian François Bordes, "They made beautiful tools stupidly."

About 30,000 years ago, at the start of the upper Paleolithic, Neanderthals seem to disappear. Their place is taken by Cro-Magnon man, modern humans who brought with them a culture probably developed in Asia. The Aurignacian period ushered in the beginnings of communal activity and living. People hunted and fished in organized groups, lived in the first man-made shelters, wore sewn clothing, and left the first evidence of belief in magic and the supernatural. They were imaginative artists who decorated cave walls with their paintings and carved ornaments of bone, horn, and ivory. Moreover, they crafted new kinds of tools, including projectile points, of different materials including flint and obsidian.

We find the first evidence about 25,000 years ago of the Gravettians, whose range eventually extended from Russia to Spain. They brought west with them improved methods of knapping spear tips of stone, making them more lethal and easier to sharpen, and the atlatl, a spear thrower that effectively lengthens the hunter's arm and thereby increases the power and range of the thrown spear. Recent finds in Czechoslovakia are convincing evidence that the Gravettians were also weavers, not just of basketry and textiles, but also of nets for snaring small animals. Change was happening faster and faster in Europe, each group of newcomers building on the foundation laid by the existing population.

### Enter killers with a flair for art

About 20,000 years ago a new group arrived, some scholars think from the east, others from North Africa. They took up residence in caves and rockshelters in France and Spain—and western Europe was never the same again. We call them the Solutreans. They were highly efficient hunters, the likes of whom probably weren't seen again until the



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white slaughterers of the American buffalo in the 19th century. Estimates of the number of wild horses killed in the upper Paleolithic at Solutré alone range from 30,000 to 100,000. Full bellies gave them leisure time, which they used to decorate the walls of their caves with fabulous surrealistic paintings of bison and horses and ibex that continue to awe us today. They were carvers, too, for art's sake. In Solutrean sites we find carved limestone tablets—at one site in Spain there are stacks of hundreds. Stanford describes them as “3 to 6 inches long, 3 inches wide, and half an inch thick. The design, sometimes zoomorphic, sometimes geomorphic, is engraved on one side or both.” They weren’t drilled and made into pendants. They don’t do anything. Perhaps they have religious significance. Or perhaps they just *are*.

What made the Solutreans deadly efficient hunters was their unprecedented skill at fashioning tools and weapons from stone. In the 4,000 years of their supremacy we can see their knapping creations evolve from unifacial points (later reappearing as the willow-leaf point, unifacial again, but of extraordinary delicacy and fineness) to bifacial laurel-leaf points and blades.

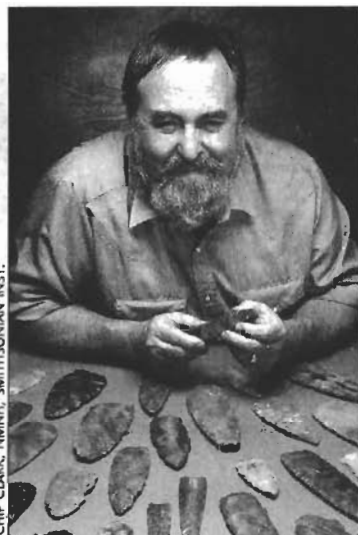
“They had the only upper-Paleolithic biface technology going in Western Europe,” Stanford points out. They were the first to heat-treat flint, and the first to use pressure flaking—removing flakes by pressing with a hardwood or antler tool, rather than by striking with another stone. “In northern Spain, their technology produced biface projectile points with concave bases that are basally thinned,” he notes, not bothering to say he could just as well be describing Clovis points. The pressure flakes Solutrean knappers removed are so long it’s *almost* a fluting technique—“almost,” he’s careful to say, but not quite.

The parallels between Solutrean and Clovis flintknapping techniques seem endless. The core technology, “the way they were knocking off big blades and setting up their core platforms,” he explains, “is very similar to the Clovis technique, if not identical.” They perfected the *outré passé*—overshot—flaking technique later seen in Clovis, which removes a flake across the entire face of the tool from margin to margin. It’s a complicated procedure, he emphasizes, that has to be set up and steps followed precisely in order to detach regular flakes predictably. When you see *outré passé* flaking in other cultures, you’re looking at a knapper’s mistake. The Solutreans, though, set up platforms and followed the technique through to the end, exactly as we see in Clovis. “No one else in the world does that,” Stanford insists. “There is very little in Clovis—in fact, nothing—that is not found in Solutrean technology,” he declares.

Archaeologist Kenneth Tankersley of Kent State University

seconds Stanford and Bradley’s opinion: “There are only two places in the world and two times that this technology appears—Solutrean and Clovis.”

On and on the similarities pile up. We find carved tablets in Clovis sites remarkably similar to Solutrean specimens. Both cultures cached toolstone and finished implements. (See “Lithic Caches” in this issue.) Stanford and Bradley know of about 20 instances of caches at Solutrean sites; in North America, by comparison, according to Stanford, “we’re up to about nine or ten.” Just like Clovis knappers, Solutreans used flakes detached by *outré passé* to make scrapers and knives. Clovis bone projectile points bear an uncanny resemblance to ones made by Solutreans. When French archaeologists saw the cast of a wrench used by Clovis craftsmen at the Murray Springs site in



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Stanford with casts of the Anzick Cache assemblage.

Arizona to straighten spear shafts, they declared it remarkably similar to one found at a Solutrean site.

In 1997 Stanford was invited by French archaeologists to bring specimens of Clovis tools and weapons to an exhibit at the museum of Solutré, organized by Anta Montet-White and Jack Hofman of the University of Kansas. It was on that trip in the summer of 1997 that Stanford, able to compare Solutrean and Clovis tools side by side, became confident he was looking at products of technologies so similar there was a high probability they were in fact historically related technologies—one culture—separated only by time and distance.

### A tough mouthful for critics to swallow

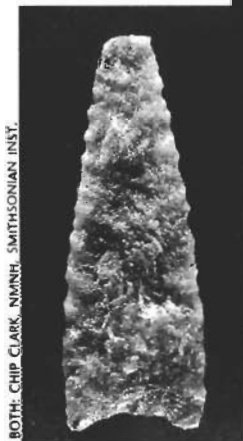
Stanford and Bradley know it’s asking a lot of their fellow archaeologists to accept the idea that the first immigrants set foot on the Atlantic seaboard of North America. Time and distance are indeed hurdles of considerable height. The Clovis and Solutrean cultures are

▲ A fragment of a Solutrean point from the Asturias Regional Museum of Archeology in Oviedo, Spain. In appearance and knapping technology, it is astonishingly similar to a point fragment found at the Cactus Hill site in Virginia.

◀ A Solutrean point from Spain—fluteless, but sharing many features of Clovis points made thousands of years later on the other side of the Atlantic.

separated in time by more than 4,000 years, in space by the Atlantic ocean—nearly 3,000 miles today.

When Stanford and Bradley are in a temporizing mood, they allow the possibility that the astonishing constellation of similarities that exist between Solutrean and Clovis technologies may



BOTH: CHIP CLARK, NMNH, SMITHSONIAN INST.

be the result of independent invention, that bright chaps at two different times and at two different places on Earth may have hit on the same ideas—a lot of them—each by himself without outside influence. Indeed, Stanford is by no means an inflexible dogmatist. “It’s very clear to me, at least,” he is quick to state, “that we are looking at multiple migrations through a very long time period—of many peoples of many different ethnic origins, if you will, that came in at different times.”

For the record, Stanford and Bradley say they push their theory “as the most parsimonious conclusion based on the best available data currently available.” But if you talk to Dennis Stanford one-on-one about this particular migration that

**Smithsonian archaeologists (and husband and wife) Pegi Jodry and Dennis Stanford enjoy a summer’s day in France.**



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establishes the Solutrean-Clovis connection, he doesn’t hedge. You quickly realize he is a self-assured scientist who is supremely confident that time will prove him right. Listen to his argument, and you have to allow that he has thought a great deal about every side of this theory.

### Tackling the question of time

Setting aside for the time being the problem of how Solutreans crossed the Atlantic, and assuming it was a trip they could undertake and survive, the question then arises: Why don’t we see signs of their presence in North America 4,000 years before Clovis?

But we *do* see evidence of them, Stanford and Bradley counter, at two sites. At Meadowcroft Rockshelter in Pennsylvania, stratified deposits that predate Clovis by several thousand years—the lowest occupation level dates to 19,000 years ago—have yielded remains of basketry and lithic artifacts including blades and points, *unfluted bifacial projectile points*. Clovis-First proponents have contested the radiocarbon dates for nearly three decades now, asserting that radiocarbon dating samples may have been contaminated with coal particles or other carboniferous material carried by groundwater. Although geomorphologist Paul Goldberg of Boston University in 1999 declared unequivocally that “no trace of groundwater activity could be seen”—after minutely examining 25 samples from six layers at Meadowcroft—James Adovasio’s labors still haven’t received universal recognition.

Meadowcroft Rockshelter would stand as a one-of-a-kind perturbation in the archaeological record if not for the Cactus Hill site in eastern Virginia. The hill is the accumulation of windblown sand over many thousands of years, according to Joseph and Lynn McAvoy, whose private consulting firm, Nottoway River Survey, has been excavating side by side with the Archaeological Society of Virginia. What they’ve found is a continuum of human occupations dating backwards from the colonial period—witness a pipe stem and a sixpence piece dated

1696—to the Clovis culture. Below the Clovis level, above a bed of sterile clay, they found an assemblage of stone tools including blades and cores and *thin bifacial points*. Radiocarbon dates from a hearth and other features put human occupation at 15,000–17,000 RCYBP, or about 18,000 to 20,000 years ago. Artifacts from Cactus Hill share so many of the features of the

Meadowcroft Rockshelter finds that Stanford and Bradley contend the two sites could be considered related technologies, or even two instances of the same one.

Unfortunately, just as at Meadowcroft Rockshelter, a cloud of skepticism hangs over the Cactus Hill site. Any number of agents—animals, looters, even intrusive roots—could

have introduced old charcoal into layers containing younger artifacts, say the McAvoy’s critics. They point to different samples from the same layer reporting different ages as corroboration of their concerns about contamination. This, despite the McAvoy’s repeated protests that Yale University paleobotanist Lucinda McWeeney judged the anomalous dates to be nothing more than the result of young plants burrowing downward. There’s absolutely nothing to show that older material was pushed upward, say the McAvoy’s . . . over and over again.

Stanford and Bradley confess themselves impressed by the fit of the evidence found at Meadowcroft and Cactus Hill. Bifacial weapon tips, blades, and blade cores found at the sites are technologically very similar to Solutrean examples; the radiocarbon dates (if believed) dovetail nicely with the period of the Solutrean culture and fill in the 4,000-year gap. In a paper now in press, Stanford and Bradley deplore the inequity in disallowing evidence from Meadowcroft and Cactus Hill. Their statement is a model of restraint:

Must we wait until yet a third or fourth site is found before we can take this evidence seriously? Probably so. However, we believe that this same rigor of analysis demanded by scholars of these sites has not been applied to the Beringian sites that many consider ancestral Clovis; but it should be.

### Supporting evidence from a different source

Archaeological evidence isn’t the only weapon in Stanford and Bradley’s armory. They point out discoveries in genetics by researchers at Emory University and the Universities of Rome and Hamburg. Mitochondrial DNA (mtDNA), which is inherited exclusively from the mother, normally contains four markers called haplogroups, labeled A, B, C, and D. These four are shared by 95 percent of Native Americans. Recently, however, the genetics team identified a fifth haplogroup, called X, which is present in about 20,000 Native Americans and has also been found in several pre-Columbian populations. A most interesting fact is that haplogroup X is also present in European populations

but absent from Asians. The geneticists' research suggests the marker may have existed in the Americas 12,000 to 34,000 years ago, which means it must have been introduced before Clovis. By whom? Stanford and Bradley's prime candidates are Solutreans.

### Now, about that Atlantic crossing . . .

There's a curious paradox at work here. The aspect of Stanford and Bradley's theory their critics find hardest to accept, that anyone could have crossed the Atlantic Ocean 20,000 years ago, doesn't worry Stanford at all. What's more, he says he rarely finds a European scientist who considers the Atlantic an insurmountable obstacle to determined Solutreans. "They aren't like landlocked Americans," he says of his European counterparts.

Stanford argues from a position of logic, historical data, and common sense. "Everyone knows boats have been around for 50,000 years," he says. Long ago early people in different parts of the world developed the skills needed to navigate open seas. People on the Japanese mainland 29,000 years sailed to offshore islands and returned with obsidian, their preferred toolstone. "Common sense tells us," he concludes, "one leg of the round-trip journey had to be against the current or wind or both." The early Japanese obviously solved the problems of sailing to windward. So must have done ancient mariners in Greece, where 13,000 to 14,000 years ago they regularly sailed from the mainland to collect obsidian from the offshore island of Minos. Why, then, can't we credit the Solutreans, who mastered the working of stone and created stunning works of art, with the same caliber of resourcefulness and problem-solving skills?

Evidence abounds from recent years that the Atlantic Ocean can be crossed in watercraft a lot smaller and less sophisticated than a liner. In 1896 two Norwegians, Harboe and Samuelson, rowed from New York to Le Havre in a dory, which can hardly be considered a high-tech contrivance. In 1976 Irish scholar and explorer Tim Severin built the *Brendan*, named after and constructed according to records left by St. Brendan, a sixth-century Irish monk, who (if you can sort myth from fact) sailed from Ireland to America. Severin built his *curragh* of 49 ox hides stitched to a wooden frame and waterproofed with sheep tallow, just as St. Brendan is said to have built his craft, and followed the same route described by the saint: north to the Faroes, then riding east-west currents that sweep past Iceland and Greenland. He landed at Newfoundland after a harrowing voyage—his first sail in a leather-skin boat.

There's also anecdotal evidence that amazing voyages are sometimes made by accident. The BBC in 1999 related the story of five African fishermen who were caught in a storm. In the grueling journey that followed, two died, but three eventually found themselves in South America. Dennis Stanford recalls an incident when he was working in Alaska. It was in the '60s, pre-Pipeline days, when, as he puts it, "Eskimos were still pretty much Eskimos." Stanford hunted and fished with them. "Sure," he says, "it's dangerous. You can freeze to death or get lost, but

the Eskimos had been doing it for thousands of years." One day at Point Barrow he got word that two natives wanted to see him—urgently. The urgency, it turned out, was because they had heard he was visiting and wanted to talk to him about New York, to tell him what a strange city it was and how much they had enjoyed it. He asked the natural question: How in the world had they managed to see New York City? They told him their amazing story that had begun one spring, when they were hunting on the frozen Arctic Ocean. The ice broke up sooner than expected, and they found themselves adrift on an ice island. It floated around the North Pole and eventually drifted south east of Greenland. They were floating between Greenland and Iceland when the Iceland Coast Guard picked them up. They had spent the whole summer drifting. They weren't in despair, but they did admit they were starting to get a little worried because the island was melting away under their feet. They got a trip home, with a stopover in New York on the way—having made nearly a complete circumpolar voyage with minimal survival equipment.

### No strangers to their marine environment

Stanford's Eskimo friends survived a voyage most of us would consider unthinkable because they were adapted to their environment. Stanford has no doubt that Solutreans, too, learned to adapt to conditions in Europe in the Last Glacial Maximum. It was a stressful time for the land and its creatures. Low temperatures, a short growing season, and scarce rainfall displaced animals and people from the interior to fertile areas along rivers and the coastline of southwestern Europe. People learned to exploit alternative resources found along estuaries and the beach, for if the Ice Age was a time of hardship existence on land, it was a time of abundance along the sea. At the time of the Middle Solutrean, when Stanford and Bradley believe the Atlantic crossings were made, winter sea ice formed as far south as the Bay of Biscay. With the ice came marine life that thrived in the ice-edge habitats, including fish, sea mammals, and birds.

Today Arctic waters, not the tropics, are the food factories of the oceans, where plankton and krill multiply in abundance. The same was true of the Last Glacial Maximum. Samples of deep-sea cores indicate that foraminifers, one-celled animals (their accumulated shells form the White Cliffs of



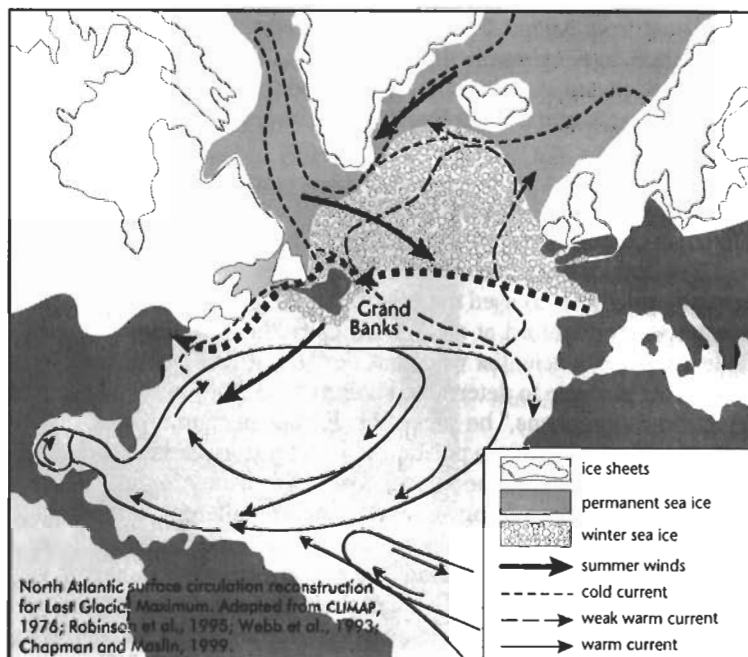
A Clovis-like bone projectile point from Altamira cave in northern Spain.

Dover), found temperature and salinity quite tolerable. Presence of this basis of the food chain would have insured in turn the presence of abundant numbers of fish, and the sea mammals and birds that fed on them. "Remember," Stanford says, "that Solutreans were at least in part shore dwellers. At the time of maximum glaciation the sea level was down 130 m [about 425 ft]. They were living on the edge of the ocean. You can't tell me they didn't figure out how to exploit that really rich subarctic water that was coming into the Bay of Biscay and along the coast."

Stanford is confident that Solutreans adapted to a maritime way of life. Surely they built boats, almost certainly skin boats,



In the Last Glacial Maximum, at the time of the middle Solutrean period, a permanent ice rim connected the southwest coast of Ireland to the Grand Banks. In winter, the Atlantic froze as far south as the Bay of Biscay. The Gulf Current that today extends across the North Atlantic was shifted southward; it circulated clockwise, moving toward the coast of Portugal and returning westward from North Africa. The Gulf Current in turn warmed a weak counterclockwise current that flowed from the Irish coast toward the Grand Banks and returned to the Bay of Biscay. Contrary to popular belief, the North Atlantic at this time was not unrelentingly hostile. Short-term intervals and possibly longer periods of moderate weather would have enabled even inexperienced navigators to sail along the ice rim. Eventually hardy sailors would have traveled the short winter route to the Grand Banks, stupendously rich in fish and game. From there the leap to North America was assured.



the universal craft built by primitive people who have ready access to animals for leather and only rudimentary tools for working wood. The problem is that leather and wood are highly perishable materials. Stanford resigned himself to the probability that we would never find direct evidence to substantiate the Solutreans' seagoing skills.

Then in 1992 Le Cosquer cave was discovered near Marseilles by diver Henri Cosquer. Today the cave mouth lies 100 ft below the surface; in Solutrean times it would have been on a hillside 300 ft high several miles inland from the Mediterranean. The cave walls are profusely decorated with outlined human hands, complex geometric designs, and paintings and engravings of animals including horses, ibex, auks, and Megaloceros, the great Irish elk with 100-pound antlers spanning 11 ft. Penguins are represented, too, which speaks volumes about the diversity of game available along Pleistocene shores. But what most interests Stanford and Bradley is that among the rock art figures are depictions that may be seals impaled by harpoons as well as possible flounder and halibut—deep-sea fish! Clearly Solutreans learned how to exploit marine resources.


### Steppingstones across the Atlantic

We haven't yet found the limits of the Solutreans' hunting forays and explorations. It appears they established camps on the pleniglacial beaches and estuaries of northern Spain; if so, they could easily have ranged as far north as the south coast of Ice Age Ireland. A site found in an unglaciated area of the British Isles was originally thought to be of Solutrean age; on a trip to England last spring, Stanford learned the site has been redated and is now considered even older, a pre-Solutrean occupation.

It requires only a small leap of Stanford's imagination to envision a voyage, perhaps intended, perhaps accidental, beyond areas already explored by the Solutreans. "Tell me," he says, "after 4,000 years of casting their eyes at the water, that all those hunters along the coast didn't understand weather and waves and ice. In the spring, when the ice broke up, they could put out to sea in flexible skin boats, along with huge ice islands, following the current." His critics argue that even the *Titanic* couldn't make the crossing. He turns the argument against

them, for the same iceberg that sank the *Titanic* would have provided a safe haven for seafarers caught in a storm. They could have pulled their boats up onto it and huddled under the inverted hulls for shelter. For that matter, the permanent ice that bridged the Atlantic, and the sea ice that extended further south in winter, would have provided limitless opportunities to haul out their boats and hunt ice-edge game.

It was only a question of time, in Stanford's opinion, until a boatload of bold Solutreans would have traveled the mere 1,200 to 1,500 miles to the Grand Banks, which, because of the greatly lowered sea level, was the northeasternmost extension of North America. There they would have found fisheries and game animals prolific beyond their wildest dreams. They would have returned to this frozen land of plenty again and again . . . until one day an inquisitive Solutrean wondered if there wasn't some place with even *more* fish and game just over the western horizon. The distance from the Grand Banks to the coast of glacial North America is so short it makes the final leg of the journey inevitable.

Once here, they quite understandably would have settled initially along the shore and rivers—having just crossed the Atlantic, they would have been comfortable near water and probably uncomfortable away from it. Of course, if their first settlements were at the water's edge, they now lie under fathoms of water. Gradually, however, they would have turned their exploring instincts inland. Meadowcroft Rockshelter and Cactus Hill, Stanford and Bradley believe, just happen to be the only evidence we've found so far of the sires of Clovis. 

—JMC

How to contact the principal of this article:

Dennis Stanford  
Smithsonian Institution  
MNH-304  
Washington, D.C. 20560  
e-mail: stanford.dennis@nmnh.si.edu

## More Bits and Pieces

*continued from page 3*

Orr believed the rise and fall of Lake Lahontan could be dated by radiocarbon assays on the tufa deposits which mark the various lake levels on the hillsides around the ancient lake. However, Orr placed more faith in the tufa dates than the dates on wood and other organic materials. This faith resulted in confusing reports of chronological indicators, including changing the reported site elevations and averaging widely disparate dates to support his model that Lake Lahontan was still at a higher elevation than Fishbone Cave at 11,500 RCYBP (thus rejecting his earliest dry wood date). According to Orr, the lake then conveniently dropped below the cave for a human occupation at 11,200 RCYBP, then rose again to a high stand around 9,700 RCYBP, even though the older dry materials had not been inundated. This contradiction was emphasized with even more conflicting tufa-based data later in Broecker and Kaufman.

At the same time, Roger Morrison conducted an extensive geological survey of the Carson Sink. Morrison inferred a terminal high stand date of 12,500 B.P. from continental climatic correlations. He called this high stand the "middle member" of the Seho formation, which he ultimately concluded was the highest lake stand of the Seho formation. Immediately following the last high stand, Morrison clearly defined a Late Seho recession to "near desiccation" (down to 3920 ft/1195 m) around 11,500 RCYBP, (exactly opposite of Orr's claim). This desiccation interval is evidenced by the formation of the Harmon School Soil, marked at the type locality by a subaerially weathered zone of deep lake clay with pedogenesis. Following this dry interval, Morrison defined a moderate lake rise to 3990 ft (1216 m), which he named the upper member of the Seho formation (Late Seho). At the Harmon School locality, the upper Seho is marked by lithoid tufa slabs resting on a disconformity on top of the Harmon School Soil, which are buried by lacustrine silt and sand on which the later Toyeh soil was developed. This final return of Lake Lahontan, the upper Seho, was sche-

matically graphed by Morrison between 10,500 and 7,500 RCYBP with a peak around 10,000 B.P. This lake was far below the highest lake levels, but higher than any lakes since that time, meeting the same definition, almost, of the Anathermal lakes, mentioned above. Forty feet separates the lake shores mentioned by Heizer and Morrison, with a significant difference in geographic extent.

Morrison correlated his soil pedogenic and stratigraphic model with Antevs's model and Russell's model. The postulated 9,700 RCYBP high stand of Broecker and Orr appeared absurd, despite the apparent quality of the scientific data and analysis. Similar problems of conflicting information were found in the Lake Bonneville area of Utah. This combination of conflicting tufa and dry organic dates contradicting stratigraphic geological reconstructions led Marie Wormington to conclude:

In view of the stratigraphic evidence, it is difficult to believe that these dates can be correct. If they are, all previous interpretations of the terminal history of Lakes Lahontan and Bonneville must be wrong. For archaeologists the geological situation is one of complete confusion. There is little that they can do but bide their time and await clarification from the geologists.

This confusing situation remained in effect for decades, leaving archaeologists with no chronological environmental structure for early human occupation studies in the Great Basin. Despite the sincere effort of many dedicated scientists, archaeologists have bided their time for over 40 years awaiting "clarification from the geologists"....

### New Bits and Pieces in Lahontan Chronology

Dansie and Jerrems began to assemble all available materials related to Lahontan chronology in 1999. Utilizing approximately 200 radiocarbon dates, we constructed a preliminary graph of lake elevations through time. The discoveries outlined above led us to believe that we had made some important progress toward a culturally relevant chronological model filling in the "Early Man" void. However, other than two cases there were virtually no cultural or paleontological dates for the terminal Pleistocene in the

Lahontan Basin. Gruhn and Bryan's significant charcoal date of  $10,700 \pm 70$  RCYBP (Beta-21885) was associated with the exquisite small stemmed point from Handprint Cave above the Black Rock Desert. The other early date, Orr's Fishbone Cave "date" of 11,200 (or 11,555 or 10,200) RCYBP, did not date the textiles, despite the literature to the contrary. The 11,080 RCYBP date on the Wallmann mammoth was dubious, both for cultural association and date reliability.

### An Archaeological Test of the Paleohydrological Model

This dearth of dates prompted us to search the old collections for specimens that would date more than one component of our model. Owing to the ongoing

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*Robson Bonnicksen, Director*

research with Erv Taylor's UCR Radiocarbon Laboratory, we also sought bone and tooth pairs that would contribute to the new quest for reliable enamel dates. Much like the bone and hair pair dates that produced significant scientific discoveries in the last six years, the superb bone preservation in some Lake Lahontan contexts is bound to yield surprises. Early human remains and related assemblages in the Nevada State Museum—Spirit Cave Man and Wizards Beach Man—were recently dated between 9,470 and 9,040 RCYBP, for example.

In presenting our results, we combine the Haynes model applied to the Lahontan basin with the results of our dating project; and include some new geo-

**Y**OU MIGHT EXPECT a woman who has spent her entire professional life exploring beds of lakes that haven't seen significant water in 4,000 years and who isn't afraid to carry her share of a man-size load to be of a different cut from the average woman. In Amy Dansie's case, you'd be right. She's an extraordinary person, a dedicated scientist who isn't afraid to get her hands dirty. Dansie is independent-minded, too, and sometimes a bit irreverent.

She retired several years ago after 28 years with the Nevada State Museum in Carson City. In her career she worked side by side with scientists of the stature of Jonathan O. Davis, Don Tuohy, and Smithsonian anthropologist Douglas Owsley. Lake Lahontan has yielded discoveries that are pivotal in the study of early Americans—the Spirit Cave Man and Wizards Beach Man are the most famous—and Dansie has been involved with them all.

#### **A challenging workplace**

In "More Bits and Pieces," Dansie and coauthor Jerry Jerrems describe some of the problems that have beset investigators trying to decipher the geochronology of Lake Lahontan. Vast deposits of tufa—calcium carbonate from evaporated lake water—gave misleading dates when first tested nearly half a century ago by conventional radiocarbon-dating methods. Conflicting data frustrated early attempts to plot the rise and fall of the lake, making it impossible to construct an accurate chronological environmental model of the lake in the Pleistocene and early Holocene. Marie

# Making Order out of Bits and Pieces

Wormington, the late authority on early peoples in the Americas, complained that there was little archaeologists could do "but bide their time and await clarification from the geologists." Studies of early human occupation in the Great Basin were delayed by decades.

Working at Lake Lahontan hasn't been unmitigated drudgery, though. This is a fickle country. Dansie and her colleagues have found animals that were entombed in Pleistocene mud—a reminder that this was once a fertile land that teemed with camels and mammoths and bison. Today their remains are astonishingly well preserved, even including, she says, "the contents of their digestive tracts." Other remains have been found in a cave similarly protected by enormous deposits of bat guano, a testament to the profusion of insect life about Pleistocene Lake Lahontan.

#### **A career brightened by successes**

Sometimes nature drops a gift into the archaeologist's lap. Fierce storms of el Niño in 1982–83 ravaged the West Coast. But floods and high winds on Lake Lahontan uncovered remains of camels and a horse that were discovered by an amateur collector. (One camel was dated at  $25,470 \pm 230$  RCYBP.)

Floods also unearthed ancient burials. A

team from the Museum recovered the remains of nearly 200 early Americans. Together Dansie and Don Tuohy salvaged 26 complete burials and the remains of over 150 individuals. The Stillwater Burial Project marked the high point of cooperation between the Museum and the Paiute Tribe, the indigenous Native Americans. Dansie designed a burial crypt, which the U.S. Fish and Wildlife Service built on federal land near Fallon, Nevada. Human remains are housed in a series of boxes made of rot-resistant redwood. By agreement with the Paiutes, the crypt is opened every two years and newly discovered human remains are deposited. "We had the perfect reburial solution," Dansie boasts, "an accessible crypt." The reburial crypt remains a success today and serves as a model for the country. She was confident her amicable working relationship with the Paiutes would continue uninterrupted, even under the terms of NAGPRA (the National Graves Protection and Repatriation Act, which allows Native American tribes to claim human remains with which they are affiliated).

#### **A soured relationship**

The Spirit Cave Man was the sticking point. Discovered in 1940, this

logical data generated by other researchers, which are not widely known. . . .

#### **Oldest Dryas, before 12,600 RCYBP**

**The McGee Point** No overview of Lahontan geoarchaeology would be complete without mention of the McGee point, an obsidian biface found in direct association with mammoth or mastodont bones, buried 25 feet below the top of the "upper lacustral clays," deep within the middle Seho lake sediments. . . . Russell reported extensive vertebrate bone beds in the same geological section. This artifact is the first scientifically documented archaeological site in the Lahontan basin. The McGee point would

date to before 14,000 RCYBP, the end of the Thiolite recession or possibly to a brief drop in the high stand suggested by the Benson tufa date 12,890 RCYBP (I-10026, 4277 ft, 1303 m), based on Russell's geological description. We reserve judgment, although it is apparently related to the stemmed point tradition, consistent with Bryan's hypothesis of pre-Clovis-age stemmed points in the Far West. It is also reminiscent of Cressman's report of artifacts found below the 13,000-year terminal flood deposits farther north, as mentioned in Bryan and Tuohy.

**High Stand Megafauna Dates** Two dates on extinct megafauna address the

timing of the last high stand and regional correlation of pluvial lakes. A *Camelops* carpal (foot) bone, at the Jessup embayment, dated at  $13,070 \pm 60$  RCYBP (NSRL-3014), firmly dates the last (maximum) high stand of Lake Lahontan 1.

Our date on the remains of a short-faced bear (*Arctodus*) encased in tufa from Duck Flat, northwest of Gerlach, Nevada, dates the Pleistocene Lake Surprise rise toward the last high stand at  $13,820 \pm 50$  RCYBP (UCR-3919/CAMS-69401). This location was a shallow bay at the last high stand not far from Lake Lahontan, and the 800 years between these two bone dates is consistent with the amount of tufa deposition on the bear

mummified early man was first judged to be about 1,500 to 2,000 years old. For years the remains lay in the Museum until sophisticated dating methods put the age much older, at  $9415 \pm 25$  RCYBP, or about 10,300 calendar years old. Even though there was no credible evidence that the skeleton was affiliated with the Fallon Paiute, tribal members resented the Museum administration's refusal to accord him tribal status. "Whenever the press would inquire," Dansie recalls, "we would reply that we had no evidence he was directly related to northern Paiutes." Tempers flared.

Increasingly tribal representatives pressed the Native Americans' case. Dansie recalls an exchange with an especially adamant elder. When he insisted that his people have always been here, she replied (possibly a bit sharply), "Nobody has always been anywhere." In his next breath, the tribal representative then boasted that his people had defeated and put to flight the original inhabitants of the land, and Dansie realized arguing was useless.

The breaking point was reached when the Museum contracted forensic sculptor Sharon Long to perform a facial reconstruction of Spirit Cave Man. The tribal elders took offense at the exhibit and first asked, then demanded that the Museum stop showing even photos of the sculpture. A standoff developed and continued until Newsweek published its story in 1998 on early Americans. The timing was unfortunate, since a new state government had just taken office in the Nevada capital. New officials were taken completely by surprise to see the facial

reconstruction of Spirit Cave Man on the cover. Repercussions from the dispute created a climate that Dansie found stifling. She was stripped of her responsibilities as the Museum's NAGPRA representative who



AMY DANSIE

had an understanding of the scientific importance of the early Nevada skeletons and given duties of an entry-level curator. She retired from the Museum in 2000.

### That horse project


One of Dansie's last projects at the Museum was also the most backbreaking—almost literally. A display was conceived to heighten the public's awareness of the

mustang, the wild horse of the Great Basin. Although the mustang is protected by law today, it is nonetheless despised as a nuisance by many ranchers. The Museum administrators felt an exhibit might promote public understanding of the complex issues, and Dansie thought a comparison of an ancient horse skeleton with a full-size modern specimen would add realism. So she undertook to deflesh a mustang skeleton by herself. "I have no one to blame but myself," she admits. Plunging body parts into boiling water and lifting the bones clear turned out to be quite a workout—followed by six months of restoring the fossil skeleton and helping assemble both skeletons for display. Her back still hasn't forgiven her.

### Still practicing archaeology

*Old Bones, Etc.* is the company Dansie founded. She's enjoying

**Amy Dansie with the Wizards Beach horse, uncovered by severe el Niño storms. Its age is estimated at 25,400 RCYBP.**

modest success, providing archaeological services for cultural resources management and setting up computer databases for private archaeological companies. She says the work summarized in her report, "More Bit and Pieces," may be the last research project she will ever undertake. Horses? From now on she's sticking with the old, old ones. 

—JMC

skeleton. The excellent preservation of the bone and intact anatomical position are consistent with the death of the bear at the edge of the rising lake water. This date directly addresses the question of synchronicity of the northern Great Basin lake stands with the Lahontan system, at least for lakes at the same latitude.

### Bølling, 12,600 to 12,080 RCYBP

**The Lahontan Crash:** We have summarized above the evidence that the lake receded rapidly after 12,540 RCYBP. Benson et al. documented the last high Pyramid Lake tufa date (4336 ft/1322 ft) at 12,540 RCYBP, the first low date at

12,370 RCYBP (3800 ft/1159 m) and the last low tufa date (3800 ft/1158 m) at 12,030 RCYBP. These data suggest the lake dropped 536 ft (163 m) in 170 years, at a rate of 3.15 ft (0.96 m) per year—the Lahontan Crash. The close agreement of the evidence for the Lahontan Crash with the onset of the dry Bølling at 12,600 RCYBP is compelling evidence of continental climatic correlation.

### Older Dryas, 12,080 to 11,970 RCYBP

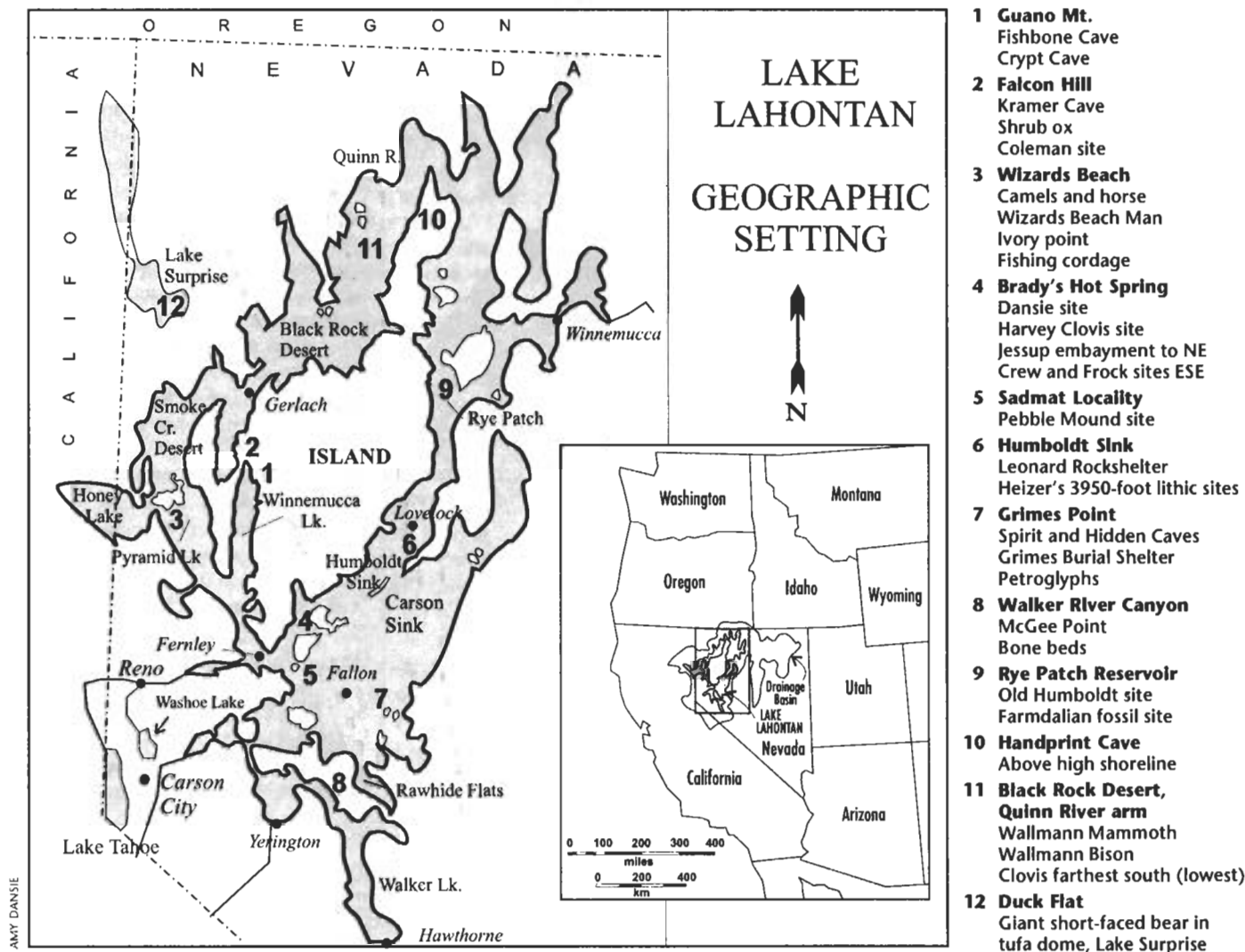
We have no Great Basin data to report from this short cold period. However, the next dated specimen follows the end of the Older Dryas by only 20 radiocarbon years.

### Allerød, 11,970 to 10,970 RCYBP

**Mega fauna Survive the Crash:** Our date on the Falcon Hill shrub ox (*Euceratherium*) maxilla, dated at  $11,950 \pm 50$  RCYBP (UCR-3780/ CAMS-59155), shows a moderately late survival of this rare extinct "sheep-ox." While not directly related to Lahontan lake levels, it does demonstrate that some megafauna survived the initial onset and duration of the Bølling and the Older Dryas; and it is synchronous with the onset of the Allerød 11,970 RCYBP. This shrub ox was assumed to predate human occupation, and there is no evidence of human association.

Good evidence exists for continued low lake levels throughout the Bølling/





Pleistocene Lake Lahontan today and its archaeological landmarks. This is familiar country to Amy Dansie; she has worked on and off more than 20 years sorting out its geological, archaeological, and paleontological history.

Allerød. Davis's wood date on the last deep lake sediments of 11,490 RCYBP demonstrates that Pyramid Lake had dropped to low levels at least by the middle Allerød, if not long before in the early Bølling.

#### **Intra-Allerød Cold Period (IACP), 11,360–11,100 RCYBP**

**Fishbone Cave Horses:** Orr identified a "horse splint bone awl" from Level 3 in Fishbone Cave, which is clearly an artifact; and claimed a large agate biface and uniface were directly associated with the marrow-fractured mandibles and long bones of two horses from Level 4. The small horses (a younger and older individual) are actually onagers, similar to the wild hemionies of the Asian steppes. Orr also claimed these horse bones and artifacts were associated with a partial burial including textiles and a prepared pelican skin, although he clearly knew this association was dubious. The significance of Orr's work and the Fishbone Cave evidence remained obscure owing to Orr's lake chronology model and confusing records. To resolve the prob-

lem, direct dating of the irreplaceable specimens from this unique setting can salvage real information, as the field and laboratory documents are adequate for independent stratigraphic analysis. The collections are well curated and catalogued.

Stafford dated one of two Fishbone Cave horse mandibles (#1) at  $12,280 \pm 520$  RCYBP (AA-759) as part of the Lahontan Chronology studies of Benson and Thompson [in] 1987. We thought it was vital to determine the age of the other mandible (#2) because they both exhibit strong evidence of cultural modification. Fishbone Cave horse mandible (#2) dated  $11,350 \pm 40$  RCYBP (UCR-3783/CAMS-59288), a date 930 years later than the other horse mandible (#1). Because of this wide discrepancy, we re-dated . . . mandible #1. . .

—Amy Dansie and W. Jerry Jerrems

How to contact the principals of this article:

Amy J. Dansie and W. Jerry Jerrems

Old Bones, Etc.

3714 Woodside Drive

Carson City, NV 89701

e-mail: ADansie@aol.com