The Prehistoric Capital of the World

That's what the French call the cluster of caves and rock shelters 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 Moustarian 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 explains 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 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.

The 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.
PLEISTOCENE LAKE LAHONTAN: FILLING IN MORE BLANKS

Anthropologist Amy Danise 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—Spirk Cave, Man and Wajrds Beach Man are the most famous—but it doesn't give up the secrets of its past easily.

Danise and collaborator Jerry Jerens 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 CSBA 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 defined 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 Danise and Jerens'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-tinted, fresh-water Pleistocene lake in the northwestern Great Basin, with a large island featuring a highstand glacial refugium. It was about 900 feet deep at Pyramid Lake (274 m), inundating 8,665 square miles (22,442 km²) when it reached its high stand at an elevation of 3386 ft (1038 m) above sea level at 15,070 B.P. 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 astronauts go to the trouble to collect toiletries and create from it weapons and tools—some of them magnetic—then bury them? An anthropologist from Idaho earned his master's from an English university by rigorous research into this cache.

11 The un-Boring 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 many respected authorities are proposing exactly that theory, and even their doubters admit they make a bit of sense.

18 The energy that drives Bits and Pieces

A profile of Amy Danise, whose backyard is a Lake Lahontan (that's Pyramid Lake in the distance.)
We want you to assist in understanding the climate and human culture of the Great Basin. The Great Basin is ideal for studying climate change because the data from the last 14,000 years is preserved in the lake deposits. We want you to understand the relationship between the climate and human culture in the Great Basin. The climate records from the lake deposits show that the climate has changed over time, and this information can be used to study the relationship between the climate and human culture.
and Haynes reports that no mammoth or Clovis artifacts are found above (after) this event. Immediately above the last mammoth bones in the driest pond 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 14CBP.

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 Jr. [1983] 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 1950s, 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 climatic 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 ice present. He adjusted the timing of the Altithermal to 7500 to 6000 [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 (14CBP).

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 (Hamblin Culture in the caves, Gran- tiee Culture on the shorelines) with Anathermal lakes of 3500 feet (1074 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 (11,195 ± 570 14CBP, C-14 dates on Lahontan Rockshelter and 11,151 ± 570 14CBP at Danger Cave) were important correlations documenting the pluvial lake recessions. He said little about the earlier Danger Cave sheep dung date of 13,453 ± 690 14CBP. The 10,000 Great Basin pluvial lake with which archaeologists were most familiar was a gradually declining high stand through 7,000 B.P. The related assumption was that lake levels around 3500 ft (1074 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 carnelian beads in Level 4 of Fishbone Cave. We have scrutinized these claims and re-dated critical specimens; and discuss them below. Orr reported radiocarbon data of 11,550 ± 500, 10,900 ± 300, and 11,200 ± 250 14CBP (1,245) on wood from Level 4 of Fishbone Cave. He implied one of these dates was on twined shedred barking 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 14CBP. He did not like the 11,550 ± 500 date, re-dating until he was satisfied with the 1,245 published date of 11,250 ± 250 14CBP, continued on page 17.

Article Questioning Radiocarbon-dating Accuracy Draws Fire from Scientists

When we published "Terrestrial Evidence of a Nuclear Catastrophe in Paleolithic 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 Pleis- tocene times that "reset the radioactive clock." They challenge the accuracy of radiocarbon dating at strikes at the vitals of many Earth sciences.

Mammoth Trumpet has received a rebuffal from Firestone and Topping's article from two expected authorities on radiocarbon dating: John R. Southon, Center for Accelerator Mass Spectrometry, Lawrence-Ivermore 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

CACHES DON'T COME IN a standard package. The typical cache is an assortment of roughed-out pieces of chipped stone, 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 artist 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. Theories suggest 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 6 miles from Twin Falls lies a 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 Bonnichsen, 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 1996 near Wilah, 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-Richley Cache, discovered in 1987 near East Wenatchee, Washington, containing 14 Clovis points (overissue 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, Kohutopp 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 witt: THAT’S BIG SAGEBUSH. THAT’S IDAHO CLOVER, FMJ. 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-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 is a visible remnant of Lake Bonneville.) Water-tumbled and polished boulders, "Bonnevillian eggs," attest to the water’s fury. Kohutopp keeps a small one on his desk. In a separate episode, the Cordilleran Ice Sheet blocked the Clark Fork 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 Kohutopp, 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 BCYBP, within the window of 10,800-11,200 BCYBP, the generally accepted period of the Clovis culture in North America. The assemblage is remarkable in several respects. The Shoshone Falls, shut in 1952 by pioneer photographer Clarence Biscoe (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.

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 Sharrack for defining 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 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 bilaces, 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 size or other material that would be used to halt the point. In fact, the basal margins of all five points have been ground for improved holding, 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 Kohnstopp treats in his thesis.

Kohnstopp 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 geochronologist C. Vance Haynes, Jr., one of the bilaces may be made of Albates 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 5 m (about 16 ft) in diameter; the ground on which the artifacts lay and the artifacts themselves were stained with red ochre.

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 ochre may also have been used as a polishing agent by ancient knappers, like jewelers' 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, Director of the Herrett Center receives many inquiries about caches, especially from graduate students. "There have been isolated papers written on caches," Kohnstopp 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 research had never included more than four theories in a paper; Kohnstopp's thesis discusses five or six theories for caching. Of course, this speculative scholarship was unacceptable to his thesis director. The University of Leicester demands solid scientific research and sound scholarship. Kohnstopp, 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 bilace 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-
Outemine drawings of the components (left and) of the China Creek Cache, Rock Creek Cache, and Cedar Draw Cache.
The DeMoss site, discovered in 1895 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 25 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. It's 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. Strope, former professor of geology at the College of Southern Idaho, believes the archaeological sites in southern Idaho didn't start to dry up until about 10,000 years ago. If the pluvial lake that covered the Big Canvas Prairie was extinct during the Clovis period, it's possible the artifacts of the Simon Cache were a waterfaring. That, in turn, raises an intriguing question: Did Clovis people know how to make and use watercraft? Smithsonian archaeologist Piotr Jordy 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 Kohlroth's thesis. He decided by the sake of comprehensiveness he would discuss the other caches beside. Two of them proved to be more interesting than he expected.

Rock Creek Cache

This tributary of the Snake River offers a fresh-water 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 Prew 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 artifacts, including 52 flakes of ignimbrite, a local variety of obsidian. All the flakes are black except three of reddish brown color. Woods and Dr. Prew describe them as generally ovoid 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 ± 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 bilaces may have been intended for production of those points. Nearby Woods and Prew 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 Elko by a worker on a hydroelectric diversion dam, the Cedar Draw Cache consists of a scraper and nine ovoid bilaces of ignimbrite that appear to be performable. 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 as the Rock Creek Cache artifacts. Kohlroth 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 indenta-
thion that nearly fractured one bilace. In some cases the knapper removed flakes so large they almost cross from one margin to the other—"out of fashion," or overshoot 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 Gaye Faye, 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 bilace blands 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 signification in the way they were placed. Found clustered nearby were a broken bilace blank, a small scraper, and a bilace resembling a lanceolate point. Although it hasn’t been proved that these objects are part of the cache of seven bilaces, 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 Rocks Shelter in the Western Desert of Australia are made of two local chert, even though superior stone was plentiful nearby.) Some of the Simon Cache bilaces 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 bilaces is made of nearly pure-white chert that Bonnichsen believes may come from the Toosawhii Quarry near Winnemucca, Nevada—a distance of nearly 300 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 archaeology 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 Timms 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 water site. Recently Bill Bonnichsen (Rob Bonnichsen’s brother), a geologist at the University of Idaho, visited the site and confirmed that the Big Cams 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.

How to contact the principal of this article:
Steve Kohntopp
Magic Valley Realty
1236 Addison Avenue E.
Twin Falls, ID 83301
email: swk@fittertel.com
"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 depositions 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 Bonnichsen 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

James Chatters' reconstruction of Kennewick Man

Symposium
Friday, Feb. 22, 2002 7-10 P.M.
Tickets $20 Students $10
Frank Lloyd Wright Mult-City Civic Center
Exhibit Hall Theatre, San Rafael, California

Sponsored by
Center for the Study of the First Americans
Kim Martindale Productions
Foundation for Archaeological Research

For Ticket Information and Map
www.ClovisandBeyond.org
Kmen@clovisandBeyond.org
Toll free: 877-587-2455
ACCORDING 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 1964—descended into temperate North America. We know they left 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. Living Bruce of the University of Michigan revealed the results of his study, which postulates that two crossovers, 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 Wormanston, 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 pro-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 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-theorists, notably expert Bruce Bradley. Stanford and Dr. Bradley independently looked at the evidence and arrived at the same conclusion. They inspected late Paleolithic 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 conical recess so that the point can be securely hafted onto a Forrestal or shaft. (See ‘Lithic Caches’ in this issue for a photo of spectacular examples of Clovis points.)

The Asian upper-Paleolithic weapon that Stanford and Bradley found, never, 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 Streletskaya 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.

Snack 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 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, suggested 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 went 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 archeologists, 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 patterns, 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 more-comfortable shelters, sewed 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 ornamental bones, horns, and ivory. Moreover, they created 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
white slaughterers of the American buffalo in the 19th century. Estimates of the number of wild horses killed in the Paleolithic at Solstice alone range from 30,000 to 100,000. Full benna gave them leisure time, which they used to decorate the walls of their caves with fabulous surrealist paintings of bison and horses and then that continue to awe us today. They were carvers, too, for art’s sake. In Solstram sites we find carved limestone tablets—at one site in Spain there are stacks of hundreds. Stanford describes them as “about 6 inches long, 3 inches wide, and half an inch thick. The design, sometimes zoological, sometimes geometric, 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 Solstrams 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 creativity evolve from unifacial points (later reappearing as the willow-point, unifacial again, but of extraordinary delicacy and fineness) to bidirectional flake points and blades.

“They had the only upper Paleolithic bifacial 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 Solstram knappers removed are so long it’s almost a fluting technique—“almost,” he’s careful to say, but not quite.

The parallels between Solstram 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 owre pene—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 owre pene flaking in other cultures, you’re looking at a knapper’s mistake. The Solstrams, 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 it,” Stanford insists. “There is very little in Clovis—in fact, nothing—that is not found in Solstram 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—Solstram and Clovis.”

On and on the similarities pile up. We find carved tablets in Clovis sites remarkably similar to Solstram 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 Solstram sites; in North America, by comparison, according to Stanford, “we’re up to about five or ten.” Just like Clovis knappers, Solstram sites used flakes detached by owre pene to make scrapers and knives. Clovis bone projectile points bear an uncanny resemblance to ones made by Solstram. When French archaeologists saw the cast of a wrench used by Clovis craftsmen at the Murray Springs site in Arizona to straighten spear shafts, they declared it remarkably similar to one found at a Solstram site.

In 1997 Stanford was invited by French archaeologists to bring specimens of Clovis tools and weapons to exhibit at the museum of Solstram, organized by Anita Monnet-White and Jack Hofman of the University of the Kansas. It was on that trip in the summer of 1997 that Stanford, able to compare Solstram 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 Solstram cultures are 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 tempering mood, they allow the possibility that the astonishing constellation of similarities that exist between Solstram and Clovis technologies may
be the result of independent invention, that bright chert at two different sites 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—if 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 Joory and Dennis Stanford enjoy a summer's day in Virginia.

establishes the Solstitial-Clovis connection, he doesn't hedge. You quickly realize he is a self-assured scientist who is supremely confident that this time will prove him right. Listens 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 Solstitials 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 10,000 years ago—have yielded remains of basketry and lithic artifacts including blades and points, unifacial bifacial projectile points. Clovis-First proponents have contended 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 laborers 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 Lynne McAvoy, whose private consulting firm, Nootway 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 fragment 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 flake bifacial points. Radiocarbon dates to a hearth and other features put human occupation at 15,000–17,000 B.C.E., or about 18,000 to 20,000 years ago. Artifacts from Cactus Hill share so many of the features of the Meadowcroft Rockshelter that Stanford and Bradley consider 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 animals—animals, hoovers, even intrusive roots—could have introduced old charcoal into layers containing younger artifacts, say the McAvoys' critics. They point to different samples from the same layer reporting different ages as corroboration of their concerns about contamination. This, despite the McAvoys' repeated protests that Yale University paleobotanist Lucinda McWorter judged the anomalously dated 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 McAvoys . . . 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 Solstitial examples; the radiocarbon dates of believed soil/valley nicely with the period of the Solstitial culture and fill in the 4,000-year gap. In a paper now in press, Stanford and Bradley deploy the isotope in dissolving evidence from Meadowcroft and Cactus Hill. Their statement is a model of restraint: 'Must we wait until a third or fourth site is found before we can take this evidence seriously? Probably not. 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 fast 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 the 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 Soltroons.

**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 barely finds a European scientist who considers the Atlantic an unsurmountable obstacle to determined Soltroons. "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 30,000 years sailed to offshore islands and returned with obsidian, their preferred stone. "Common sense tells us," he concludes, "see log 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 Soltroons, 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 1992 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 [carrack](#) of 40 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 1990 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 '90s, 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 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 circumnolar voyage with minimal survival equipment.

**No strangers to their marine environment**

Stanford's Eskimo friends survived a voyage most of us would consider unthinkably because they were adapted to their environment. Stanford has no doubt that Soltroons, 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 hardycrable existence on land, it was a time of abundance along the sea. At the time of the Middle Soltroon, 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 Maxi-

mum.

**Today's 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 that accumulate 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 Soltroons 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 Soltroons 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 Solsteinian 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 unintermittently 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 Solsteins’ seagoing skills.

Then in 1982 Le Cosquer cave was discovered near Marseille by diver Henri Cosquer. Today the cave mouth lies 100 ft below the surface; in Solsteian 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, auk, and megapodes, 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 impacted by harpoons as well as possible hounds and seabirds—deep-sea fish! Clearly Solsteins learned how to exploit marine resources.

Steppingstones across the Atlantic

We haven’t yet found the limits of the Solsteins’ hunting forays and explorations. It appears they established camps on the peninsular 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 Solsteian age; on a trip to England last spring, Stanford learned the site has been redated and is now considered even older, a pre-Solsteian 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 Solsteins. “Tell me,” he says, “after 4,000 years of cataloging 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, 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 Solsteins 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 Solstein 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 inlets—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 lathams of water. Gradually, however, they would have turned their exploring instincts inland. Meadowcroft Rockshelter and Cacatus Hill, Stanford and Bradley believe, just happen to be the only evidence we’ve found so far of the sires of Clovis.

How to contact the principal of this article:
Dennis Stanford
Smithsonian Institution
MNH-904
Washington, D.C. 20560
email: stanford.dennis@mnh.si.edu

—JMC
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 hillside 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 11,550 RCYBP (plus rejecting his earliest dry wood date). According to Orr, the lake then conventionally 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 material 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 15,500 B.P. from continental climatic correlations. He called this high stand the "middle member" of the Seboh formation, which he ultimately concluded was the highest lake level of the Seboh formation. Immediately following the last high stand, Morrison clearly defined a Late Seboh 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 Harman School Soil, marked at the type locality by a subaerially weathered zone of deep lake clay with pedogenics. Following this dry interval, Morrison defined a moderate lake rise to 3990 ft (1216 m), which he named the upper member of the Seboh formation. (Late Seboh). At the Harmon School locality, the upper Seboh is marked by bedding 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 Tooyah soil was developed. This final rise of Lake Lahontan, the upper Seboh, was schematically graphed by Morrison between 10,500 and 7,500 RCYBP with a peak around 10,000 B.C. This lake was far below the highest lake levels, but higher than any lakes since that time, meeting the same definition, almost, of the other ancient lakes, mentioned above. Forty feet above 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 8700 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 geologic 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 bite their time and wait clarification from the geologists."

This confusing situation remained in effect for decades, leaving archaeologists with no chronological or 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

Dunleavy and Jerrenas 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. Grush and Bryan's significant charcoal date of 10,700 ± 70 RCYBP (Beta-21885) was associated with the exquisite small stemmed point from Handpoint Cave above the Black Rock Desert. The other early date, Orr's Fishbone Cave date of 11,200 (or 11,550 or 10,200) RCYBP, did not date the textiles, despite the literature to the contrary. The 11,080 RCYBP date on the Wallman 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 research with Turk Taylor's UCR Radiocarbon Laboratory, we also sought bone and tooth pairs that would contribute to the new quest for reliable calibrated dates. Much like the bone and hair pairs 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-
Making Order out of Bits and Pieces

Wormington, the late authority on early peoples in the Americas, complained that there were few archaeologists who could do "but blip 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. It is a filthy county. Danise and her colleagues have found artifacts that were encrusted in Pleistocene mud—a reminder that this was once a less 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 cornels and a horse that were discovered by an amateur collector. (One cornel was dated at 25,470 ± 230 RCYBP. Floods also unearthed ancient burials.

The McGee Point No. overview of Lahontan geochronology would be complete without mention of the McGee point, an obsidian bilace found in direct association with mammoth or mastodont bones, buried 25 feet below the top of the upper lacustrine clays," deep within the middle Schoo lake sediments. Russell reported extensive verticulate 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 Thuleolite recession or possibly to a brief drop in the high stand suggested by the Benson tula date 12,600 RCYBP (l-10028, 4777 ft, 1303 m), based on Russell's geological description. We reserve judgment, although it is apparently related to the steamed point tradition, consistent with Bryan's hypothesis of pre-Clovis-age stemmed points is 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 Tushy.

High Stand Mefagamou Days Two dates on exact magnapaus address the team from the Museum recovered the remains of nearly 200 early Americans. Together Daniels and Don Tushy salvaged 26 complete burials and the remains of over 150 individuals. The Stillwater Burial Project reached the high point of cooperation between the Museum and the Paiute Tribe, the indigenous Native Americans. Danise 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 burial solution," Danise boasts, "an accessible crypt." The burial 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 secured 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 geochronology would be complete without mention of the McGee point, an obsidian bilace found in direct association with mammoth or mastodont bones, buried 25 feet below the top of the upper lacustrine clays," deep within the middle Schoo lake sediments. Russell reported extensive verticulate bone beds in the same geological section. This artifact is the first scientifically documented archaeological site in the Lahontan basin. The McGee point would...
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 915 ± 25 KYBP, or about 10,300 calendar years. Even though there was no credible evidence that the skeleton was affiliated with the Fallen Points, tribal members presented 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 Plains.* Tempees burned. Increasingly tribal representatives pressed the Native American's case. Dansie recalls an exchange on which especially adamant elder. When he insisted that his people have always been there, she replied (possibly a bit cagily). "Nobody has always been anywhere." In his next breath, the tribal representative then boasted that his people had defended 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 Shawn Lang to perform a factual reconstruction of Spirit Cave Man. The tribal elders took off at the exhibition and first asked, then demanded that the Museum stop showing even photos of the sculpture. A standoff developed and continued until Museum 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 fiasco 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 breakthrough—almost literally. A display was conceived to heighten the public's awareness of the modest success, providing archaeologi cal services for cultural resources man agement and setting up computer data bases for private archaeological compa nies. She says the work summarized in her report, "More Bits and Pieces" may be the last research project she will ever undertake. Horse!: From now on she's sticking with the old, old ones. —JMC

Allered, 11,970 to 10,970 KYBP Megalofa Survive the Crash: Our date on the Falcon Hill shrub ox (Euscmather ium) maxilla, dated at 11,950 ± 50 KYBP (UCR-37875) / CAMS-99150), shows a mod erately 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 shallow and the Old Dryas; and it is synchronous with the onset of the Allered 11,970 KYBP. This shrub ox was assumed to predate human occupation, and there is no evi dence of human association. Good evidence exists for continued low lake levels throughout the Belling/
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.

Allen, Davis’s wood date on the last deep lake sediments of 11,400 BCYBP demonstrates that Pyramid Lake had dropped to low levels at least by the middle Allen, if not long before in the early Bulling.

**Intra-Altered Cold Period (IACP), 11,360–11,100 BCYBP**

Fishbone Cave Horace: Orr identified a “horse split 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 narrow-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 hemiones 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 problem, 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 ± 520 BCYBP (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 ± 40 BCYBP (UCR970/UCAMS-90260), a date 500 years later than the other horse mandible (#1). Because of this wide discrepancy, we re-dated... mandible #1, ... 1. 1. 1.

- Amy Dansie and W. Jerry Jeerms

How to contact the principals of this article:
Amy J. Dansie and W. Jerry Jeerms
Old Bones, Etc.
3714 Woodside Drive
Carson City, NV 89701
e-mail: ADansie@aol.com