



# MAMMOTH TRUMPET

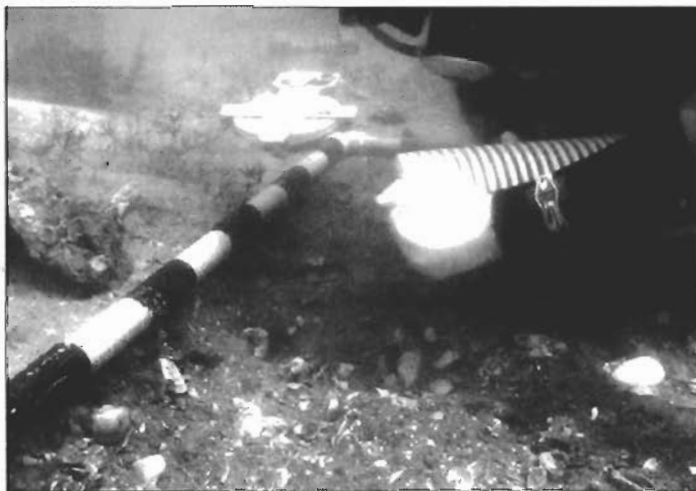
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## The underwater trail to Clovis roots

If you believe, as Michael Faught does, that the Clovis culture didn't originate in northeast Asia or Solutrean Europe but was a product of early Americans, then you look for Clovis origins where the density of discovered Clovis points is greatest—in the southern U.S. Since the first colonizers would have settled by rich coastal marshes and estuaries—now under 12 ft of water—that's where Dr. Faught's Underwater Archaeology field school team from Florida State University conduct their search every summer.

It's an ambitious undertaking. Even more challenging are his plans to explore the Clovis-age shoreline in waters nearly 100 ft deep. His story begins on **page 12**.



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## Tuberculosis Found in Mastodon Makes the Case for Hyperdisease in Megafauna

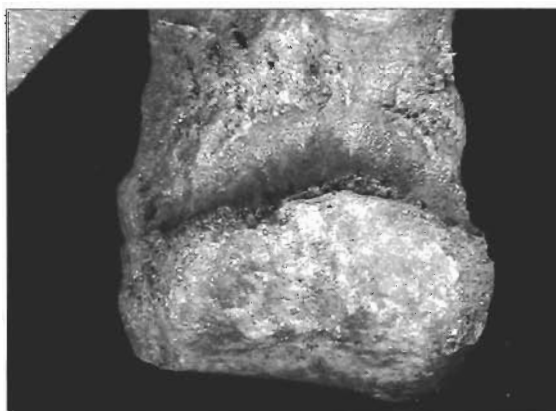
Hyperdisease—an epidemic that sweeps through an entire species—has for years been theorized as a factor that led to the extinction of Ice Age giants like mammoth, mastodon, and ground sloth. The theory has now been reinforced by powerful evidence. Bruce Rothschild has discovered that at one time probably the entire population of mastodon was infected with tuberculosis. Moreover, Dr. Rothschild, a practicing physician specializing in treating arthritis, has documented proof that mastodon—and other megamammals including bison and musk ox—suffered from the contagion for a substantial part of the late Pleistocene.

The discovery was a chance event, sparked when Richard Laub, curator of geology at the Buffalo Museum of Science, asked Rothschild to examine bones of megafauna recovered at the Hiscock site in New York for pathologies as part of a multidisciplinary approach to his ongoing investigations at Hiscock (MT

was searching for answers to particular questions. In this case, he says, he was just doing a favor by taking a look at Hiscock mastodons. He wasn't expecting to find evidence of tuberculosis damage to the foot bones of mastodons—of an individual in Dr. Laub's collection and, in subsequent examinations of mastodon collections in museums across the country, of enough specimens to convince him the disease pervaded the entire population. "This was a totally unexpected finding," Rothschild admits, "and an extremely exciting finding."

### The long search for TB in megamammals

*Mycobacterium tuberculosis*, the tuberculosis bacillus, has long been a scourge of man



A metacarpal bone from a mastodon recovered at the Hiscock site shows the lesions characteristic of tuberculosis in megamammals.

16-4, "The Hiscock Site: A Lovely Jumble of Discoveries"). Years earlier, when Rothschild had examined mastodons in his studies of Pleistocene megamammals, he

and animals. In human victims it can affect nearly any tissue in the body but usually attacks the lungs. In large animals it is commonly manifested in the bones of the feet,

## INSIDE

- 3 The ugly custody battle continues**  
*Brad Lepper keeps us up to date on appeals filed in the Kennewick Man court decision.*
- 4 The hub of research on the Southern High Plains**  
*Eileen Johnson has devoted her career to documenting the history of human survival at Lubbock Lake and on all the grasslands of the Americas.*
- 12 Clovis—a home-grown culture?**  
*Michael Faught doesn't believe Clovis was imported from Asia or Europe. He's looking for its roots along ancient waterways in the Southeast.*
- 15 The granddaddy of all Great Basin caves**  
*Danger Cave may be inhospitable to scientists, but it was a sweet home for early nomads.*

verified by Rothschild in damage seen to the joints of bison in remains dated from 9,000 to 125,000 years old. "The joint surface is normally covered by cartilage," he explains. "The bone under this cartilage is generally relatively smooth at its edges. The damage is to that edge. The area at that edge is 'dissolved,' undermining the bone. This type of undermining is

BRUCE ROTHSCHILD

Rothschild prepares a bone specimen for X-ray. A rheumatologist in private practice, he is also affiliated with institutions of higher learning and is a research associate at the Carnegie Museum of Natural History in Pittsburgh.

quite specific in humans for tuberculosis and possibly brucellosis [undulant fever]—although the latter has never been actually documented.”

The presence of tuberculosis in Pleistocene megafauna has been documented beyond dispute. Several years ago Rothschild, with associates Larry Martin, professor of paleontology at the University of Kansas, and geologist Mark Helbling, extracted DNA from 17,000-year-old bison at Natural Trap Cave in Wyoming and found the signature of TB. They have also found the pathology in musk ox, bighorn sheep, and in both modern *Bison bison* and Pleistocene *Bison antiquus*.

For Rothschild the mastodon results are phenomenal because they further document the existence of tuberculosis in North America at least 37,000 years ago (verified by a radiocarbon-dated specimen from the La Brea tar pits), well in advance of the arrival of the First Americans in any seriously considered theory of colonization. He accepts as near certainty that early Americans contracted tuberculosis from bison, mastodon, musk ox, and bighorn sheep.

### Handle these results with care

Rothschild's discovery proves the existence of hyperdisease in one major Pleistocene megamammal species. He is quick to emphasize that it does *not* prove that tuberculosis was the single cause of the animals' extinction. Here he parts company with scientists like mammologist Ross MacPhee of the American Museum of Natural History, who theorize that extinction of Pleistocene giants was caused by a virulent plague that rapidly killed off at least the sexually active and reproductive members (MT 14-1, "Explaining Pleistocene Extinctions").

"It's an interesting hypothesis," Rothschild admits, "but there's never been any documentation for it. What Ross was doing was looking for a frozen mammoth to extract DNA of the disease organism. The problem is that all you could do even if



you were successful is identify the organism; you couldn't prove the organism *did* anything. . . . If you take that approach, you have to perform an autopsy." He draws an analogy with human diseases, say, influenza. Unless you can show evidence of the disease, merely showing presence of the virus doesn't mean a thing; it may have been a mild case of flu. However, when a person dies of influenza, there are discernible changes in the lungs—that can only be detected by autopsy.

Caution is especially necessary with tuberculosis, a notoriously insidious relapsing disease. Drawing again on the human analogy, it's worth noting that tuberculosis was once so widespread in the American population that at the start of the 20th century nearly every adult tested for tuberculosis was tuberculin-positive,



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indicating exposure to the TB bacillus. Yet most people functioned normally without hindrance from the disease, which remained dormant. "Look at Amerindians," Rothschild notes, "and what happened with invasion by Europeans. European contact didn't expose them to TB; what it did was put them under stress." It was the stress of crowding and starving, he emphasizes, that caused TB already present in the population to become active.

In like manner, Rothschild believes tuberculosis may have been a major factor in the extinction of mastodon. "There's no question that the pathology load certainly made them more susceptible to problems," he readily concedes. A subsequent change—introduction of human hunters, for instance, or a severe climate change—may have applied additional stress they simply couldn't tolerate.

Was tuberculosis a major factor contributing to extinction? Perhaps. The single cause? Rothschild finds it highly unlikely tuberculosis or any other disease could have obliterated a species like mastodon. A private pilot, he notes that in virtually every instance a plane crash is


found to be the result of a series of misadventures, not of a single event. He asks, "Why should extinction be any less complicated?"

### Revisiting old ground, on to new

For Rothschild, examining mastodon remains at the Buffalo Museum of Science was renewing an old acquaintance—and not an altogether pleasant one. "Ten to fifteen years ago I had done work with megafauna," he explains, "and had the bruises to show for it." The problem is the immensity of the massive bones. "The bones are so big I get hurt every time I work with them. I get all cut up and bruised," he says, then adds, "When you work with patients, it's not an environment where you want to have open cuts."

When he saw evidence of tuberculosis in Hiscock mastodon and realized the implications, he asked himself why he hadn't noticed it before. Then he realized that most skeletons he had examined in earlier years were missing the foot bones—where the disease manifests itself. The reason is unclear. One authority suggests that since many mastodon remains are bog finds, with the animal

found in the standing position, most archaeologists don't excavate deep enough to retrieve the feet. Laub believes the bones of the feet, easy for scavengers to get at, become disarticulated; being small, they're easily overlooked in an excavation. Lesions from tuberculosis are found on metacarpals, sometimes on phalanges, whether the fore foot or the hind foot. It's equally true for bison, musk ox, and bighorn sheep as for mastodon.

We haven't heard the last of Rothschild's remarkable discovery. In October the *Journal of Rheumatology* will publish his article on the history of hyperdisease in North America. There, he says, the focus is on rheumatoid arthritis and another kind of human arthritis. And, he promises, it's all tied in with this story. 

—JMC

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# Kennewick Man Ruling Defended in U.S. Court of Appeals

On May 21, Alan Schneider and Paula Barran, attorneys for the scientists who have gone to court in order to have the opportunity to study the 9,000-year-old remains of Kennewick Man, filed their opening brief in the U.S. Court of Appeals for the Ninth Circuit. In a landmark decision, Federal District Court Magistrate John Jelderks ruled in August 2002 that the Department of the Interior (DOI) had improperly applied the Native American Graves Protection and Repatriation Act (NAGPRA) to these ancient remains and that the plaintiff scientists could proceed with their proposed studies (MT 18-1).

In response to this challenge to their efforts to broaden the scope of NAGPRA to encompass all ancient American human remains, the DOI and a coalition of Native American tribes separately appealed Jelderks's decision (MT 18-2).

In two briefs, Schneider and Barran support Jelderks's decision and address the points raised by the DOI and the Tribal coalition in their appeals. They conclude that the "District Court carefully considered all of the issues and evidence in this case, and reached a decision in accordance with the law and relevant precedents. That decision should be affirmed."

Broad-based support for Jelderks's decision is reflected in the number of *amicus curiae* (friend of the court) briefs submitted to the Ninth Circuit Court from a diversity of interested parties. The Society for American Archaeology, the Ohio Archaeological Council, the Texas Historical Commission, and two pairs of eminent scholars from three California universities and the Smithsonian Institution represent a solid core of support from a cross section of the scientific community. The Pacific Legal Foundation and the Ethnic Minority Council submitted briefs strongly critical of the Department of the Interior's politically motivated decision and supportive of the public's right to know the scientific story of Kennewick Man. In this article, I focus on the scientific arguments supporting Jelderks's decision.

### Society for American Archaeology

The Society for American Archaeology (SAA), the leading professional organization  
*continued on page 10*

A marvelously diverse crew in the late 1990s—international and national graduate and undergraduate students and community volunteers—uncovers a bison kill, one of a series of kills made by post-Clovis Paleoamericans over a 1,500-year period at the marshy edge of ponds. This kill yielded Lubbock points dating to about 10,000 RCYPB (about 11,800 CALYBP).



ALL PHOTOS COURTESY OF THE LUBBOCK LAKE LANDMARK, MUSEUM OF TEXAS TECH UNIVERSITY.

# Lubbock Lake

*Three pillars of research and teaching dominate this famous Early American site*

**T**WO SITES in neighboring New Mexico, Clovis and Folsom, challenge Lubbock Lake in Texas for the title of Most Famous Paleoamerican Site in North America. Granted, Lubbock Lake hasn't given its name to a culture. (It does, however, lay claim to a Paleoamerican point, the Lubbock point, dating to 10,000 RCYPB—about 11,800 CALYBP). Lubbock Lake is nevertheless of a venerable age—it was discovered in 1936, only 10 years after Folsom. Deposits at Lubbock Lake record continuous human occupations from the Clovis age to historic times, a span of time at least equal to that of its sister sites. Moreover, Lubbock Lake boasts a distinction Clovis and Folsom can't match: when Walter Libby in 1952 applied radiocarbon dating to Paleoamerican archaeology, among the first materials he tested was burnt bison bone from Lubbock Lake.

The significance of Lubbock Lake as one of the most important archaeological sites in North America is no secret. The official name of the site, which is listed on the National Register of Historic Places, is Lub-

bock Lake Landmark (LLL), reflecting its status as a National Historic and State Landmark. Its unbroken record of human occupation for more than 12,000 years, coupled with its strategic location on the Southern High Plains, the *Llano Estacado*, makes LLL a natural laboratory for research into early Americans. The instrument of research, and the showplace for displaying its discoveries to the public, is the Museum of Texas Tech University (TTU) in the city of Lubbock. The research program was designed 30 years ago by Eileen Johnson of the Museum, who remains its research director today. "Initially it was thought to be something along the lines of a 3-year program," says Dr. Johnson. "Now it's three decades later, and we're still attempting to answer research questions we had at the start."

This tripartite structure—Lubbock Lake Landmark, the Museum of TTU, and Texas Tech University—deserves credit for the attention Lubbock Lake has commanded over the years.

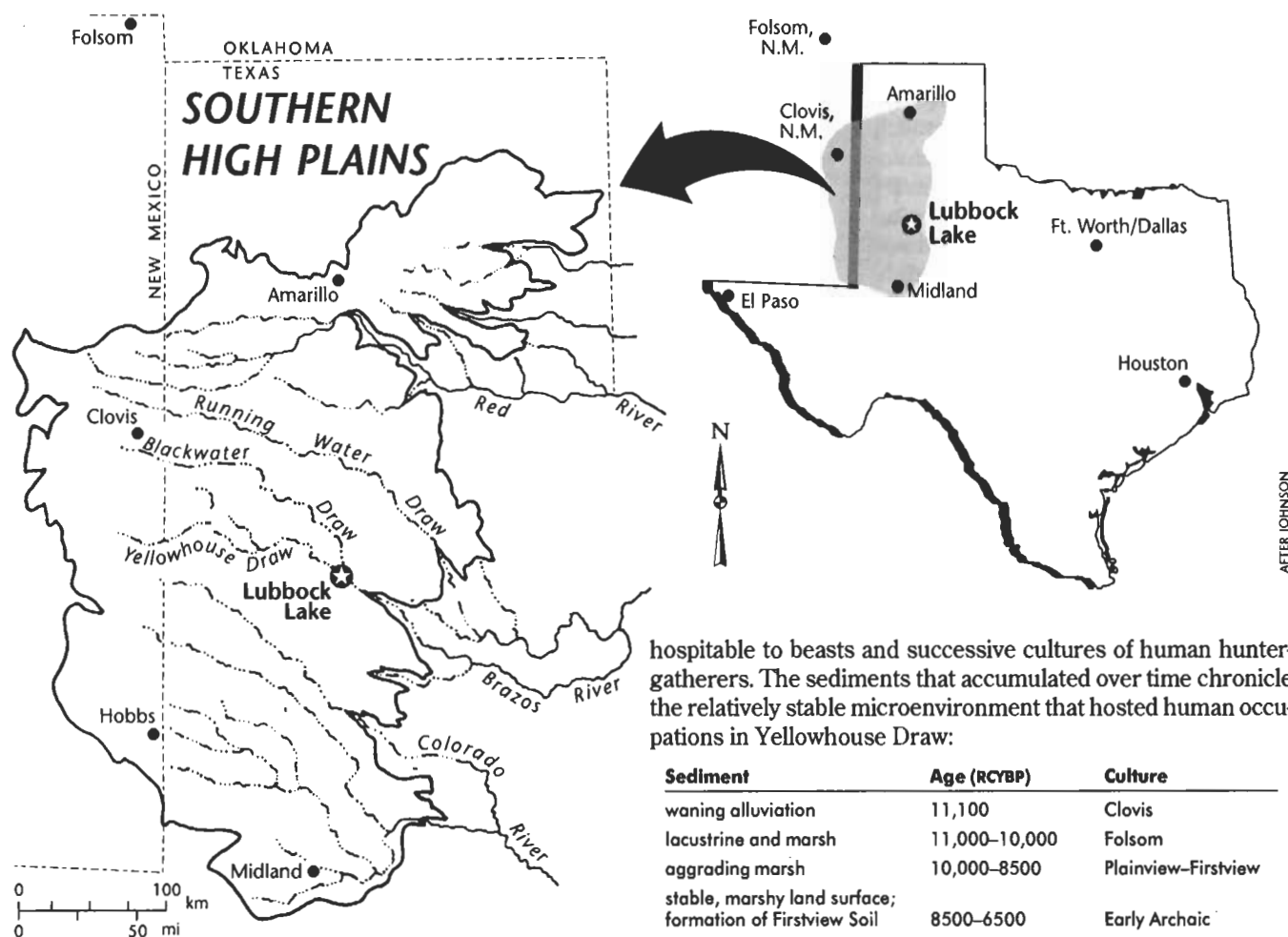
Probably LLL has been studied by more scientists and students, and has been the subject of more articles and reports, than any other site in the Americas. Lubbock Lake has consumed nearly the entire career of Eileen Johnson. Most scientists would agree it's a career well spent.

## A history bound up with water

"A Merry Little Minuet," a satirical ballad popularized by the Kingston Trio in the '50s, is a deceptively airy melody that accompanies lyrics about bloody ethnic strife, ruinous natural disasters, and imminent nuclear obliteration.



Front entryway to the Robert A. Nash Interpretive Center at LLL, named for civic leader and local historian Bob Nash, a longtime champion of preserving Lubbock Lake and researching its history.



One stanza ends with the pithy comment, "And Texas needs rain."

This bit of black humor is as true today as it was half a century ago. It has been true for thousands of years, but it wasn't always the case. At the end of the Pleistocene, the Southern High Plains had water—so much water, in fact, that torrents carved the Yellowhouse Draw as deep as 15 m (about 49 ft) through the much older Blackwater Draw and into bedrock, forming a tributary of the Brazos River. Such abundance of water produced lush vegetation that attracted game and the predators that fed on them. We know them by their remains in bonebeds: mammoth, extinct camel and horse and bison, short-faced bear, and giant armadillo. Early Americans also left their mark by hammerstones and anvils found in bonebeds, and by Clovis and Folsom points recovered from spoils dredged when the site was discovered. (It's worth mentioning that cutmarks and clear signs of deliberate bone breaking on the remains of short-faced bear and giant armadillo are the first documented evidence that man exploited these animals as a food source. Score another first for Lubbock Lake.)

Throughout the Holocene the Southern High Plains became progressively warmer and drier and were ultimately transformed into the semi-arid grasslands we know today. Yellowhouse Draw, however, fed by natural springs, remained

hospitable to beasts and successive cultures of human hunter-gatherers. The sediments that accumulated over time chronicle the relatively stable microenvironment that hosted human occupations in Yellowhouse Draw:

Sediment	Age (RCYBP)	Culture
waning alluviation	11,100	Clovis
lacustrine and marsh	11,000–10,000	Folsom
aggrading marsh	10,000–8500	Plainview–Firstview
stable, marshy land surface; formation of Firstview Soil	8500–6500	Early Archaic
calcareous lacustrine	6500–4500	Middle Archaic
transgressive, regressive marsh deposition	4500–2000	Late Archaic
	2000–500	Ceramic
	500–present	Protohistoric–Historic

### A serendipitous discovery

Water played a major role in the discovery of Lubbock Lake. This is an instance, though, of undeserved luck. Every student of human history knows that modern man has lost much of our primitive ancestors' respect for the delicate balance of nature. The inhabitants around Lubbock severely overtaxed their most precious resource, water; in their attempt to correct the insult to nature, they inadvertently uncovered a rich archaeological storehouse.

The springs at Yellowhouse Draw created a shallow lake in historic times covering about 10 acres. It appears on early Spanish maps as *La Punta de Agua* (Place of Water), and with the advent of white settlers and ranchers it once watered as many as 10,000 cattle. But a burgeoning population and increased irrigation by farmers placed unsustainable demands on the water supply. In the early 1930s, the time of the simultaneous calamities of the Depression and the Dust Bowl of the Midwest, the springs played out and the lake dried up. The citizens, not realizing overconsumption had lowered the water table, applied

for and in 1935 received funds from the federal Works Progress Administration for a dredging project to reactivate the springs.

The excavation, started by men with shovels and wheelbarrows and completed by heavy power equipment, finally breached the water table after removing 100,000 cubic yards of sediment and material, which was piled around the periphery of the U-shaped cut to form concentric dikes. Unable to rejuvenate the springs, planners decided instead to create an artificial reservoir for emergency use by the city of Lubbock fire department.

About a week after excavation had created Lubbock Lake, youngsters poking around dump piles found bones of extinct animals and a beautiful stone artifact, which William Curry Holden, director of the West Texas Museum at Texas Technological College, recognized as an intact Folsom point. Investigating the dredge spoils further, he found additional remains of bison, mammoth, and extinct horse.

### A project of heroic proportions

Research at Lubbock Lake (the name refers to the man-made reservoir, not to any prehistoric topographic feature) has been ongoing since the discovery in 1936, and the Museum (then known as the West Texas Museum) has been involved since that first discovery. "It's the Museum that

Much of what would ► become Lubbock Lake Landmark is visible in a 1939 aerial view of Lubbock Lake, still surrounded by historic grasslands. The newly excavated reservoir in the center is defined by berms of dredged sediments.



◀ By the 1980s the land had been modified with non-native trees and trails for off-road vehicles. In the 1950s the Museum erected a fence around the reservoir; in 1972 the protected area became the research compound.

has championed its preservation," Johnson emphasizes, "its research, and public involvement."

Lubbock Lake Landmark, like most great enterprises, owes its success to just a few persons of vision and energy. One is Dr. Holden, whom Johnson aptly describes as a Renaissance man. Archaeologist, historian, and ethnographer,

Holden founded the Museum at TTU, the departments of History and Anthropology, the Ranching Heritage Center, and the International Center for Arid and Semi-Arid Land. He had connections with many researchers throughout the Southwest, and he instantly realized the significance of the artifacts and faunal remains found at Lubbock. Today the Museum of TTU continues the work he started. Greatly enhanced facilities in place today include the Moody Planetarium at the Museum, and the Late Pleistocene Sculpture Garden and Llano Estacado Nature Trails at LLL.

Holden shares his place in history with Bob Nash, a community leader whose contribution to LLL is remembered in the Interpretive Center named in his honor. Thanks largely to his influence, the city of Lubbock preserved the area and made generous concessions to Texas Tech University. Then, in the early '70s, Craig Black, Curator of Vertebrate Paleontology at the Museum of Natural History at the University of Kansas and professor in both the Geosciences and Biology departments, was named director of the Museum of TTU. Nash put him on the spot. He told Dr. Black, The Museum has a new leader, the University is moving forward, and

The Wall, a late-Quaternary valley fill-type section for the Lubbock Lake Landmark that exposes the entire sequence of strata from late-Pleistocene to historic times. This is the "layer-cake" that Holden talked about. Johnson explains that "each stratum represents different depositional events, hydrological conditions, climatic regime, environmental conditions, and a suite of faunal and floral communities. Within these sediments, a number of buried soils developed. Dredged sediments from the 1936 dredging of the springs cap the sequence. This is the framework within which the cultural and natural history records are preserved." The metric stadia rod is 2.2 m long (about 7 ft).



now the city of Lubbock wants to move forward. What can you do for us?

Back in Kansas, Black called Eileen Johnson into his office. At the time she was a graduate student, working to complete her master's in Anthropology that May. He told her of his new position and asked her, Have you ever heard of this place? Can you do anything with it?

"After I picked myself off the floor," Johnson recalls, "I said, 'Yes, I've heard of it,' and we kind of went from there." In May both Black and Johnson found themselves in Lubbock.

Johnson was given a free hand in designing a research program that would systematically explore the resources of LLL that lie trapped in deposits up to 8 m (about 25½ ft) thick. It was intended to be her doctoral research project. Black, who held faculty appointments in the departments of Biology and Geosciences at TTU, was director of Johnson's doctoral work and chair of the doctoral committee; he thought the program would probably take three years. At the time the immense scale of the project was unknown, but the dimensions started to become evident over the years. *After 10 seasons—six years after receiving her doctorate—Johnson estimated the LLL research team had excavated less than 0.05 percent of the site.* It's now apparent this is a project that will consume the life's work of Eileen Johnson and uncounted scientists after her.



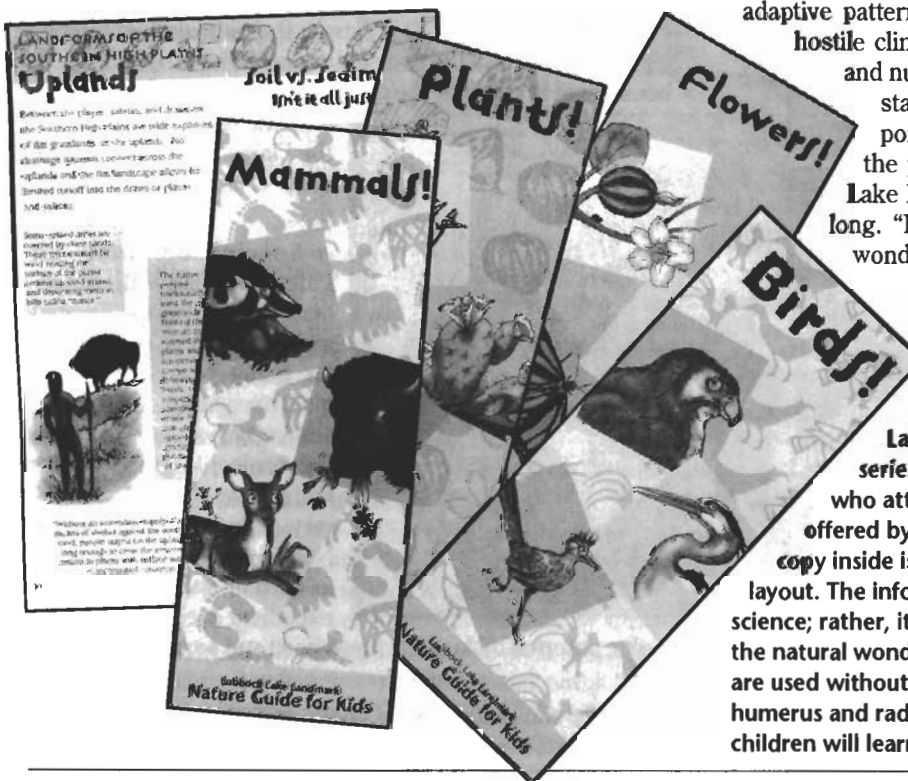
Johnson (checkered shirt) explains the excavation of an intricate hearth field, with overlapping and reused hearth pits spanning about 1,000 years from the late Ceramic into Protohistoric times, to President's tour visitors Don and Beverly McBeath, Lubbock civic leaders and supporters of LLL. As director of LLL, Johnson is careful to pursue research into the entire 13,000-year history of Lubbock Lake, not into one culture at the expense of all others.

### An ever-expanding laboratory

Over the ages the fauna changed with the changing face of the Southern High Plains, but what never changed was the dependence of man upon bison. The animal changed, from gigantic *Bison antiquus*—2,400 pounds and 7½ ft tall—that Folsom people hunted and butchered

with stone implements (MT 16-2, "A Very Delicate Tool for a Very Special Purpose" and "Bison Aren't What They Used to Be"), to modern *Bison bison*, which was the principal source of food and materials for later cultures.

Early Americans had a remarkable ability to adapt to a changing environment. Adaptation, Johnson writes, "is the means by which a group interacts with the environment, copes with constraint and stress, and sustains and perpetuates itself." By examining lithic and faunal materials, the scientist hopes to detect adaptive patterns of behavior—strategies for coping with a hostile climate and for protecting against food shortage and nutritional imbalance, tactics for modifying long-standing practices to take advantage of new opportunities. Johnson's laboratory for exploring the process of adaptation was originally Lubbock Lake Landmark. That bounded definition didn't last long. "Long ago," she admits, "I realized that LLL, wonderful as it was, couldn't and shouldn't be re-



Our black-and-white publication doesn't do justice to these award-winning color brochures in the Lubbock Lake Landmark "Nature Guide for Kids" series. They are distributed to schoolchildren who attend guided or self-guided programs offered by the Lubbock Lake Landmark, and the copy inside is as deserving of honor as the eye-catching layout. The information isn't "dumbed-down" pseudo-science; rather, it's a child's first step toward understanding the natural wonders of the Llano Estacado. Scientific terms are used without apology—pedogenesis, pistil and stamen, humerus and radius, playa and salina—on the theory that children will learn as much as we expect of them.

## An Enduring Bond

It's a truism that archaeology today simply cannot exist, let alone prosper, without support, whether in the form of funding or volunteers or government assistance. The extraordinary success of Lubbock Lake Landmark and the Museum of TTU is due in no small measure to the trust and friendship that has existed between the staff and the Lubbock community over the years.

This photo, taken in 1974, points up an example. On the left is Craig Black, then director of the Museum of TTU; in the middle is Arch Lamb, at the time Lubbock County Commissioner; on the right is community leader Bob Nash. They are standing in front of a County water truck in the bottom of the old, dry reservoir. Eileen Johnson recalls the occasion:

I needed a better set-up to water-process by provenience all the sediments we were excavating. Bob arranged with the County to have them excavate a very large holding tank into the floor of the reservoir (all into bedrock as the late Quaternary valley fill had been removed in 1936) and keep it stocked with water. We pumped water out onto our nested fine-mesh screen racks. Within a year or two, Bob had arranged for the City to let us pipe water above



ground from a nearby city well. Used this system through the 1983 or 1984 field season.

This nurturing environment didn't come about by accident. Johnson and her predecessors have worked hard to keep it healthy.

searched in isolation." Her research team needed a broader, regional perspective, and she next chose for their region the entire 50,000-square-mile Southern High Plains.

Well, the Museum still has an active regional program, but the "region" has completely outgrown even its enlarged proportions. Today Johnson's regional perspective embraces all the grasslands of the Americas from the Canadian border to Argentina, and the greatly expanded scope brings her into frequent contact with Latin American scholars. She is convinced that research must be a joint venture, for collaboration yields mutual benefits. "For an American to go into a foreign country," she says, "collaboration is not only the ethical thing to do, it makes possible greater research productivity." The Latin American scientists she works with are, in her words, "just terrific."

Joint research has validated her pan-American regional perspective. Johnson and colleague Gustavo Politis of CONICET, the Faculty of Natural Sciences and La Plata Museum in Argentina,

W. Curry Holden explains to interested members of the Lubbock community the significance of stratigraphy (he called it "layer-cake geology") and why it is important to preserve LLL. This was Holden's last tour, around 1970.



note striking similarities between the Great Plains of North America and the pampas of Argentina, and corresponding similarities in Paleoamerican subsistence strategies in the two areas (see Suggested Readings, "New World Grasslands Hunter-Gath-

ers in the Late Pleistocene and Early Holocene"). The two areas, despite their separation by 5,000 miles, share a host of characteristics:

- **Geology** Loess deposits blanket extensive regions of the pampas and the Northern Great Plains. There is also evidence the pampas may have experienced a dry spell in mid-Holocene times similar to the Altithermal of the Plains.
- **Single-species subsistence** In both areas, hunter-gatherers exploited a variety of grazing animals at least 13,000 years ago; after widespread faunal extinctions on the pampas during the early Holocene, both cultures focused on a single herd herbivore—guanaco on the pampas, bison on the Plains. A further parallel exists in the animals that supplemented the diets of the two cultures and whose remains have been found at kill sites: the glyptodon of Brazil and Argentina; and the giant armadillo of the Plains, a pampather and close relative of the glyptodon.

■ **Specialized tool kit** Paleoamerican flintknappers in both areas created stylized projectile points—for many years archaeologists have noted the striking similarity between the fish-tail projectile point of the Pampas and the contemporary fluted Clovis point of North America. Craftsmen in both areas also practiced expedient technology, fashioning assorted tools of fractured bone and percussion-flaked stone.

These are similarities, not a one-to-one match, Johnson and Dr. Politis readily admit. Certainly there are major differences

between North America and South America in the late Pleistocene and early Holocene—an obvious example is that large parts of South America were already forested. When the focus is limited to the Great Plains and the pampas, however, they write that “the numerous striking similarities indicate a broad area of overlap that provides a significant opportunity for comparative research.” The considerable body of knowledge scientists have accumulated over the years for the Great Plains grasslands provides an excellent foundation for building a database for the pampas. And every piece of information added to the pampean model becomes a check on the North American counterpart. Joint research is an expanding spiral that creates a happy situation where everyone wins.

### The future at LLL

Directing research at a site as impressive as LLL, which possesses a continuum of occupations that spans more than 13,000 years, means making tough decisions. Right now Johnson finds her research options somewhat limited.

The problem?

You guessed it: water.

“This area is very strange,” Johnson observes (an observation that won’t come as news to anyone who has lived on the Southern High Plains). “We are, of course, semi-arid. Water right now is a fairly limited resource. However, Lubbock and other cities in the region suffer from a dome of water that has flooded basements and caused

A Folsom point ► recovered by Joe Ben Wheat during the 1939–1941 test excavations at Lubbock Lake. Sad to report, no photo exists of the original Folsom point found in 1936—it was stolen from the Museum collection.

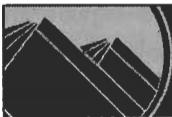


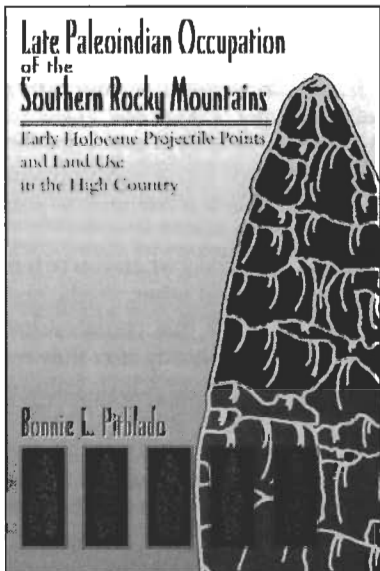
◀ Another famous point, a Lubbock point of Pedernal chert, is barely 1,000 years older than the high point of the Clovis culture. This point is 7.15 cm long (a bit less than 3 in).

other complications. LLL, being in the low part of the [Yellowhouse] Draw, saw its water table rise dramatically in 1979. Throughout the '80s and into the '90s, all our major Paleoindian excavations were flooded and became inaccessible.”

Flooded basements and archaeological digs in the middle of a drought? A *very* strange area indeed.

The problem, as Johnson explains it, is caused by the numerous playas that dot the Southern High Plains. To reclaim land for farming and for recreational areas, many farmers and municipalities have knocked out the clay bottoms of playas to drain them. Probably some harbor the mistaken belief that emptying playas will replenish the


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**LATE PALEOINDIAN  
OCCUPATION  
OF THE SOUTHERN  
ROCKY MOUNTAINS**

Early Holocene Projectile  
Points and Land Use  
in the High Country

by *Bonnie L. Pitblado*

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Ogallala Formation, the principal aquifer of the Southern High Plains. In fact, water percolates down until it hits impermeable caprock, which traps it. The result is an artificially perched water table of supersaturated sediments between the cap rock and ground surface. Lubbock Lake, which was created by dredging and is therefore the lowest spot in the area, is the natural outlet for overflow from waterlogged sediments.

The Clovis-age excavation is still shallowly underwater. Johnson hopes that by summer water will drop below the surface and the soil will be workable, if a bit mucky. Other areas are now dry; recently LLL crews have been able to work in the Folsom and Lubbock excavation areas. But Johnson has no idea how long that will last. “I’m amazed we’ve had the number of years above water that we have

Excavating the Singer Store, a trading post and the first commercial enterprise in the area; its building in 1881 marks the founding of the Lubbock community.

In the right background Johnson talks with Morris Wilkes, a civic leader on the President's annual tour.

During his presidency of TTU in the 1990s, Donald Haragan invited university and community personalities to visit the Landmark. Now retired, Dr. Haragan remains an enthusiastic supporter of LLL.



had," she confesses. Once the drought breaks—whenever that might be—the water table will rise and the excavation floor will be submerged again.

Tough decisions, especially when you're tempted by deposits older than 11,500 RCYBP—in other words, pre-Clovis. Yes, LLL crews have found materials that predate Clovis, including evidence of human presence. Shortly after they realized they might be on the verge of finding a pre-Clovis culture, that excavation area became inaccessible because of flooding. Now that it appears the area may soon become accessible again, Johnson finds herself fully committed to her regional research program and other obligations. "Because our work is so long-term and resources are always limited," she explains, "I have to look at priorities and the size of the crew this year and make decisions. All that's kind of a long-winded explanation of why I'm not actively searching for a potential pre-Clovis occupation, when I still have a lot of work to do in the Paleoindian record."

She has plenty of other work to keep her busy, too. A tenured professor on the faculty of TTU, Johnson teaches graduate courses in museum science. As proof of her commitment to international shared research, she fosters an internship program, ranging from six months to two or three years, for students from countries of scientists she works with. An intern from Argentina currently in residence starts graduate school at TTU in the fall. At the same time two new Argentinean students will enter the internship program. And then, says Johnson, "We'll see what happens." 📷

*I owe special thanks to Vance Holliday of the University of Arizona, Executive Director of the Argonaut Archaeological Research Fund. Nearly a year ago Dr. Holliday suggested Dr. Johnson's 30 years of work at LLL and the Museum of TTU might make an interesting story. He was dead right.*

—JMC

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LLL Web site: [www.depts.ttu.edu/museumttu/III/index.html](http://www.depts.ttu.edu/museumttu/III/index.html)

#### Suggested Readings

- Johnson, E., ed. 1987 *Lubbock Lake: Late Quaternary Studies on the Southern High Plains*. Texas A&M University Press, College Station, Tex.
- Johnson, E., and G. Politis 1993 New World Grasslands Hunter-Gatherers in the Late Pleistocene and Early Holocene. *Current Research in the Pleistocene*, Vol. 10, pp. 24–26. Center for the Study of the First Americans, Oregon State University, Corvallis, Ore. ISSN 8755-898X.
- Johnson, E., and V. T. Holliday 1989 Lubbock Lake: Late Quaternary Cultural and Environmental Change on the Southern High Plains, USA. *Journal of Quaternary Science*, Vol. 4, pp. 145–165. ISSN 0267-8179.
- Knudson, Ruthann, E. Johnson, E., and V. T. Holliday 1998 A 10,000 Year Old Lubbock Artifact Assemblage. *Plains Anthropologist*, 43(165):239–256.

## Kennewick Man Ruling Defended in Court

*continued from page 3*

tion of archaeologists studying American prehistory, offered the court "the view of a broad cross-section of the American archaeological community" on the interpretation of NAGPRA and how it has been and should be applied in this case. In the opinion of the SAA, "the DOI's application and interpretation of the legal

standard for 'cultural affiliation' and its assessment of the evidence in the record were fundamentally flawed." Indeed, it was so flawed that, "if similar reasoning were to be followed in the future, it would be difficult to imagine a case in which cultural affiliation could not be determined—which clearly was not Congress's intent."

According to the SAA, the DOI's reasoning appears to rest on the assumption that "NAGPRA's purpose, as Indian law, is to repatriate all ancient human remains found on Federal lands." As the SAA points out, the legislative history of NAGPRA makes it

clear this is not the case. In support of their view, the SAA excerpts the following quote from the House Committee report on NAGPRA:

The first objective [of NAGPRA] deals with Native American human remains, funerary objects, sacred objects and objects of cultural patrimony which are excavated or removed from Federal or tribal lands after the enactment of the Act. . . . If any such remains or objects are found on Federal Lands and it is *known which tribe is closely related to them*, that tribe is given the opportunity to reclaim the remains or objects (emphasis added).” (For a more comprehensive review of NAGPRA’s legislative history, see MT 18-3.)

The SAA believes that if the DOI’s decision to “repatriate” the remains of Kennewick Man to the tribal coalition were allowed to stand, “it could undermine the balance of interests that the drafters of NAGPRA hoped to achieve, obstruct scientific discovery, and inhibit the growth and dissemination of archaeological knowledge to the public.”

### Ohio Archaeological Council

The Ohio Archaeological Council (OAC) is a not-for-profit corporation that acts as the major voice for professional archaeology in Ohio. It supports Jelderk’s decision and affirms that there was no evidence in the record to support the claim that Kennewick Man is culturally affiliated with the tribal coalition that has sought to obtain his remains. The OAC argues that the DOI erred when it identified the “earlier group” to which Kennewick Man belonged, and to which the coalition of tribes have claimed cultural affiliation, as “part of the Windust and early Cascade archaeological phases.” The OAC notes that this assertion includes three separate claims. First, it assumes that the Windust and early Cascade archaeological phases are valid groups for the purposes of NAGPRA. Second, it assumes that Kennewick Man was a member of a group belonging to one or the other of these phases. Finally, it maintains that there is a reasonably unbroken chain of shared group identity linking the modern coalition of tribes with Kennewick Man’s group. The OAC finds each of these claims untenable.

*continued on page 18*

## Postgraduate Field Course

 **Geomorphology and Quaternary Geology of Tierra del Fuego**  
**March 6–22, 2004**

Our first Postgraduate Field Course, held in March 2003, welcomed 18 graduates in Geology, Geography, Biology, and Archaeology from Argentina, Chile, Brazil, Spain, Ireland, Italy, Germany, Sweden, Norway, Canada, and the U.S. Visiting Professor Norm Catto of Memorial University of Newfoundland, Editor in Chief of *Quaternary International*, gave two talks on topics in his research fields. All field and lab activities and discussions were conducted simultaneously in Spanish and English, making the two languages a way of communicating and understanding among the participants instead of a barrier. The success of Field Course 2003, which far exceeded the expectations of faculty and participants, has motivated us to offer Field Course 2004. We expect it will be of great interest to our colleagues in Argentina and elsewhere and to interested persons who were unable to attend last year’s course.

### Objectives and Methodology

A faculty of distinguished scientists from CADIC-CONICET and Universidad Nacional de la Patagonia-Ushuaia, under the leadership of Dr. Jorge Rabassa, will guide participants in investigating vinculate landforms and sedimentary accumulations in different environments of the Isla Grande de Tierra del Fuego, with the aim of determining their context in Quaternary chronology and in the paleoenvironments and paleoclimates of southernmost South America. Using topographic sheets, satellite imagery, and aerial photographs, field studies will collect information to be analyzed later in the lab. Glacial, periglacial, coastal, fluvial, and aeolian landscapes, as well as peat bogs and landforms created by mass-movement processes, will be studied.

### Participants

Participants will be selected from university graduates, preferably from recent years, in Geology, Geography, Archaeology, Biology, Ecology, Agricultural Sciences, Forestry and Tourism, and related disciplines. Logistic considerations fix the minimum number at 10, the maximum at 20. Members will be chosen by the Director and faculty.

A successful applicant will satisfy these requirements: be computer literate; be proficient in Spanish or English; possess a valid passport and, if required, an Argentine visa; be a university graduate in the cited disciplines before 31 July 2003; possess a basic knowledge in Geology and Geomorphology (selected bibliographic references will be sent to prospective participants); own a basic equipment kit (a list of required items will be sent to prospective participants); possess health and accident personal insurance, valid in the Argentine Republic, for the period 6–22 March 2004.

### Costs

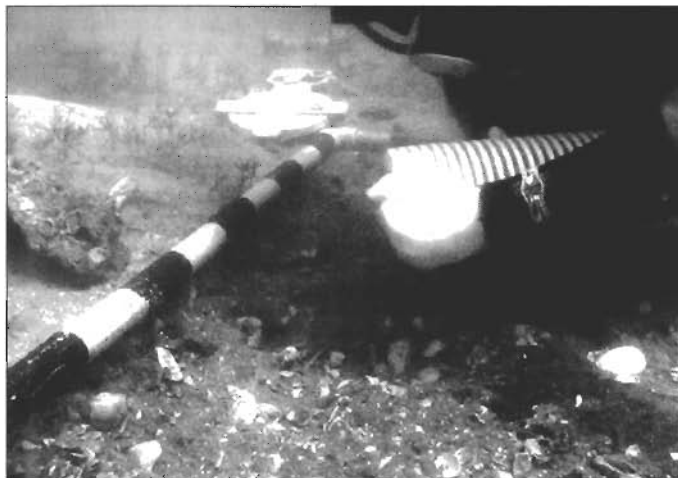
Total cost of the Field Course is \$600 (U.S. dollars) per participant, including registration fees, materials, surface transportation about Tierra del Fuego, lodging, and three daily meals. Air fare to and from Tierra del Fuego is not included. Foreign participants are recommended to secure air transportation via Buenos Aires–Rio Grande and Ushuaia–Buenos Aires. Selected participants will be informed of payment information. Do not send money orders or checks now.

### Registration and Correspondence

Applicants must provide the following information before 31 October 2003: full name; birth date; nationality; postal and e-mail address; phone number; university degree, granting institution, and graduation date; detailed curriculum vitae, including education, work and academic experience, publications, grants and scholarships, etc. Applications received after 31 October 2003 will be considered only if the maximum number of participants have not been enrolled.

Address all correspondence to:

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ALL PHOTOS: MICHAEL FAUGHT, PALEOAUCCILLA PREHISTORY PROJECT

Excavating at the J&amp;J Hunt site.

**C**LOVIS just doesn't come from northeast Asia!" Michael Faught insists during our conversation about the origin of Clovis and the peopling of the Americas.

Before us is a map showing the distribution of Clovis points in North America developed by Dr. Faught, an assistant professor at Florida State University, and David Anderson, an archaeologist with the National Park Service. East of the Mississippi River, the map is dark with color. West of the Mississippi, there is almost no color at all except in central New Mexico, southern Arizona, and the Mojave Desert. Clovis points are almost completely absent from the northwestern U.S., where you'd expect concentrations to be heaviest if Clovis had originated in northeast Asia. I am surprised. I have always thought of Clovis as a Western phenomenon. Aren't sites like Lehner Ranch, Naco, and Murray Springs along Arizona's San Pedro River typical Clovis sites? The map shows otherwise. Faught laughs and says, "What are they doing in the East? That's not where they belong!"

When pressed about whether this distribution reflects prehistoric settlement patterns, or is strongly influenced by thousands of years of erosion and deposition, Faught becomes cautious. He says he is convinced that erosion might explain the absence of Clovis points in some areas of the Mississippi River drainage. But he doesn't think geological processes wholly explain the lack of points in the West, particularly in places like Wyoming, Montana, and Idaho. The map, he insists, most likely reflects the actual distribution of Clovis people on the landscape. "They were just not in the West, or there were very few of them," he says. "Clovis really has this Southern aspect to it, which in my dissertation I showed has a radiocarbon component to it."

Faught (left) with Joe Latvis, Project Operations Manager for the PaleoAucilla Prehistory Project since 1995. Joe is responsible for logistics management and diving safety.

### Plotting early Clovis sites tells a story

Faught has compiled a database of radiocarbon-dated Paleoamerican sites in North and South America, sites with one or more occupations, each occupation having more than one radiocarbon date. Having several radiocarbon dates for the same occupation and averaging them when appropriate produces an even more reliable date. Since finishing his dissertation in 1996, he has continued to add sites to the database. Currently 40 sites are included.

Based on the data from these sites, Faught has found changes in the distribution of projectile points over time that he thinks are highly significant because of what the distribution implies about Clovis origins. "When you look at sites older than 11,000 years ago," Faught says, "it turns out that in North and South America combined there are actually only three clusters of early sites." To my surprise, these three clusters of roughly contemporaneous sites are widely distributed in space and share little in the way of technology.

The northernmost cluster is in Alaska, in the Nenana and Tenana Valleys near Fairbanks. It consists of sites such as Swan Point and Walker Road, where the assemblages are dominated

# Rethinking Clovis Origins

## A conversation with Michael Faught



by blade and microblade tools, small bifacial projectile points, scrapers, and simple cores. Animal remains associated with these artifacts indicate a broad diet of waterfowl, fish, ptarmigan, elk, bison, and small mammals. Dates on this group of sites range between 11,300 and 11,000 RCYBP (about 13,300 to 13,000 CALYBP).

The second cluster, in an area stretching from southeastern Arizona to Oklahoma, includes sites such as Blackwater Draw, N. M., Domebo, Okla., and Aubrey and Lubbock Lake in Texas. These are the oldest Clovis sites in North America, with dates ranging between 11,500 and 11,000 RCYBP (about 13,500–13,000 CALYBP). These sites are characterized by classic Clovis projectile points, sophisticated bifacial cores, scrapers, burins, and ivory tools. The tools are often found in association with the remains of extinct fauna, particularly mammoths.

The third cluster of sites dating prior to 11,000 RCYBP is in southern South America, and includes Monte Verde, Tauga Tauga and Querero, all in Chile. As with the Alaskan sites, these sites lack fluted points. They are characterized by small bifacial projectile points, grinding slabs, and tools of bone, wood, and ivory. The people occupied a wide range of habitats and utilized a diverse resource base of terrestrial, aquatic, and marine plant and animal resources.

Faught does not see sufficient similarity among site clusters to suggest that Clovis developed from either the Alaskan or South American assemblages. To Faught, it is significant that the distribution of Clovis is limited to the southwestern U.S. prior to 11,000 RCYBP.

"As the lack of fluted points in the Ice-Free Corridor, northern Montana, Wyoming, and Idaho before 11,000 RCYBP shows, the data don't support the migration scenario of coming through the Corridor or coming down the West Coast for fluted-point origins," he says. It isn't that he disagrees with a northeast Asian ancestry for all Paleoamerican groups. It's just that he doesn't think the Clovis technology was invented in northeast Asia.

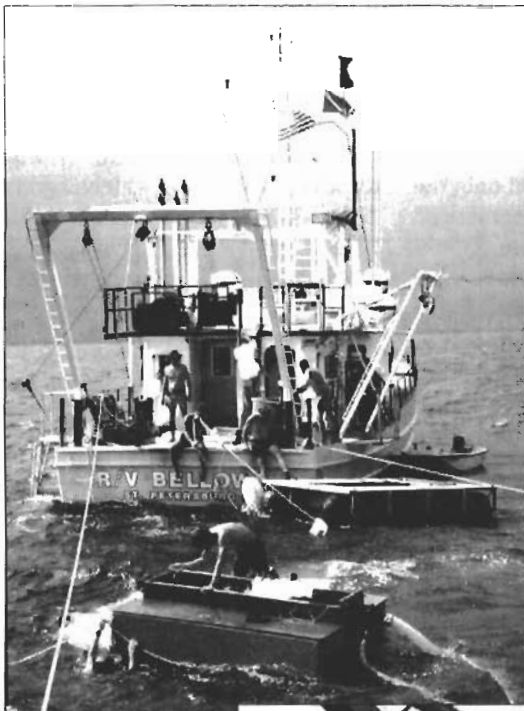
The situation after 11,000 RCYBP is much different. Suddenly, in the period from 11,000 to 10,800 RCYBP, fluted-point sites become widespread in North America, from Alaska to Central America. "In the next set of radiocarbon dates, after 11,000 RCYBP, all the sites are fluted point-related. And they are all

around 10,900 RCYBP. That's the interesting thing, these fluted-point sites that show up all at once, even in South America."

### New World origins for Clovis

So just where did Clovis technology originate? Faught isn't comfortable with the claims made by some researchers of a link between Clovis and the Solutrean cultures of France some 5,000 years earlier. And it is clear he doesn't think Clovis originated in northeast Asia. Instead, he argues, we have to look in the New World for the origins of Clovis technology and culture.

Since the ancestors of the Clovis people were probably among the first migrants into the New World, they would have had their choice of places to settle. One of the richest environments would have been the coastal marshes and estuaries, where waterfowl, shellfish, aquatic mammals, and fish would have been plentiful and easily taken, and where plant foods would have grown in profusion. Faught fully expects the coastline would have been the preferred location for initial settlement, particularly since he is convinced the ancestors of Clovis and other Paleoamericans already possessed a coastal adaptation.



◀ FSU Underwater Archaeology field school students working on Research Vessel *Bellows* at the late-Paleoamerican (Suwannee period) J&J Hunt site. The Florida Institute of Oceanography, owner of the *Bellows*, grants ship time to the field school every summer.

▼ Field school students prepare to dive at the J&J Hunt site.



Estuarine areas are plentiful along today's coastline, but that's not where Faught thinks sites will be found. The places where today's marshes exist would have been hundreds of feet above and dozens to hundreds of miles inland from the Clovis-age coastline. Finding ancient marine estuaries requires finding where the rivers met

the sea 11,000 years ago, in areas of the continental shelf now drowned by sea level rise since the end of the Ice Age. Given the abundance of Clovis materials found in the Southeast, Faught thinks the continental shelf off the western coast of Florida is a good place to start looking for early Clovis.

Faught first came to work on Florida's continental shelf in 1986. He came back five more times before graduating with his Ph.D. from the University of Arizona in 1996. He was hired on at

Florida State University in 1997 and has been on the water every summer since.

Some of Faught's earliest work in Florida was at the Page/Ladson late-Paleoamerican site along the Aucilla River in the northwestern part of the state, where he collaborated with J. S. Dunbar (Florida Division of Historical Resources) and S. D. Webb (Florida Museum of Natural History). The abundance of Clovis finds at surface sites along the Aucilla River, combined with his search for early Clovis sites on the continental shelf, led Faught to think about what he might find if he could follow the ancient channel of the Aucilla River to where it met the Clovis-age shoreline. His seminal research matured into the PaleoAucilla Prehistory Project, the first sustained effort to look for Paleoamerican occupations on the North American continental shelf.

### Archaeologist's kit: sonar and diving gear

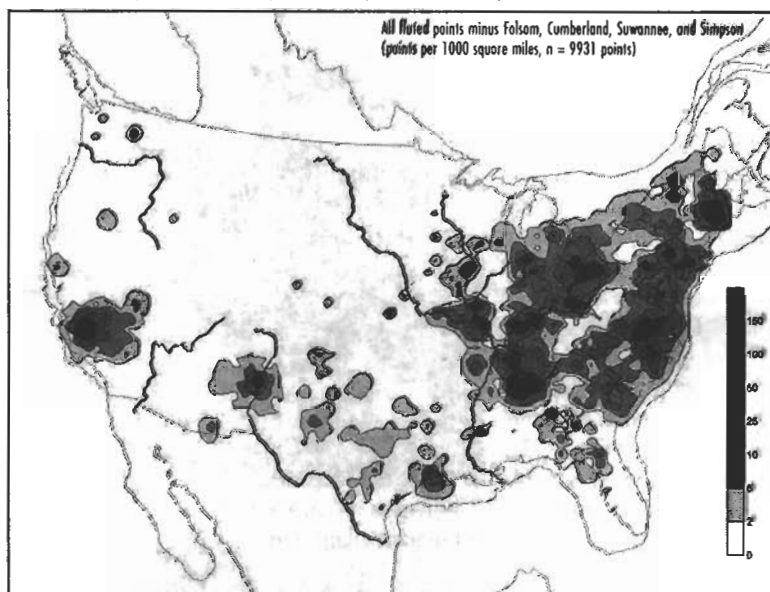
Every summer, Faught takes field school students out onto the continental shelf to look for Clovis and other Paleoamerican sites. He begins by using subbottom profiler remote sensing and side-scanning sonar to locate and map a new section of the ancient Aucilla river channel. Then Faught and his students don diving gear, slip into the warm, clear water of the Gulf, and survey the channel area looking for sites and isolated artifacts.

Faught's most important discovery so far has been the J&J Hunt site. The site is located adjacent to a chert outcrop along the PaleoAucilla channel in what would have been an inland setting 12,000 years ago, but is now 12 feet under water. Along with 1,600 pieces of

to be intermediate in time between Clovis and Bolen, which Faught argues is supported by technological similarities among the three point types.

A test pit dug at J&J Hunt using an induction dredge recovered artifacts associated with broken teeth and skull fragments of a single juvenile mastodon, but it is unclear whether the association is real or the result of different strata mixed by natural processes. However, the survival of Pleistocene fauna into the beginning of the early Archaic in Florida is verified by evidence at Darby Springs, where a Suwannee point was found associated with mastodon tooth fragments in sediments that were dated to at least 9,880 RCYBP. Recently, Suwannee points in association with extinct fauna have been reported as well from the Ryan/Harley site in the Aucilla River drainage, near the Page/Ladson site. If verified by further dating of the finds, this would be evidence that Pleistocene megafauna in Florida survived almost a millennium longer than their Western counterparts, which are widely agreed to have gone extinct by 10,800 RCYBP (about 12,800 CALYBP).

**Distribution of fluted points in the U.S.**  
Although some of the points from the Northeast might not be considered classic Clovis, the majority from the South and Southwest are indisputably true Clovis points.



chipping debris, Faught has recovered from the site a fluted-point base and a cluster of artifacts that includes three Suwannee points, a Suwannee perform, and a thumbnail scraper. The J&J Hunt site has also yielded early-Archaic Bolen notched points and middle-Archaic artifacts.

Faught believes the Suwannee points are late Paleoamerican, falling in time between Clovis and Bolen points. The beginning of this date range is set by the single known co-occurrence of Clovis and Suwannee points at the Silver Springs site, which suggests a period during which both point types were made. Suwannee points continued to be made until the appearance of Bolen notched points around 11,800 years ago. The timing of this transition is based on the occasional co-occurrence of these point types (as at the sites of Bolen Bluff and Harney Flats) and on radiocarbon dates. Dates from Page/Ladson and Little Salt Springs indicate Bolen points appeared around 10,000–9500 RCYBP (about 11,000–11,800 CALYBP); Suwannee points from Darby Springs have been dated to about 9,880 RCYBP (about 11,500 CALYBP). Thus, Suwannee appears

Although Faught has not yet found any Clovis sites along the PaleoAucilla river channel, he is optimistic: he has only traced the channel 9 miles into the Gulf of Mexico in relatively shallow water. But if Faught is optimistic, he is also impatient. The Clovis-age shoreline lies almost a hundred miles offshore in 40 m (about 131 ft) of water. There he expects to find the kind of estuarine environments where Clovis people should have settled. But if he continues to inch his way along the PaleoAucilla River, it may be many years before he gets to the Clovis shoreline. So this July Faught plans to start close to the Clovis-age shoreline, diving in almost 100 feet of water. He will use remote sensing gear to locate the contact between the PaleoAucilla River channel and the shoreline, because he feels that's still the best way to narrow the search to those areas of the ancient landscape where Clovis people probably settled.

"Almost anything that we find in the deeper water is early," Faught claims with enthusiasm. Because sea level rise was rapid after 10,900 RCYBP (about 12,900 CALYBP), the landscape was

*continued on page 20*

**T**HE GREAT BASIN of North America is about as fearsome an environment for human occupation as any place in the United States. At night the temperature often falls below freezing, even in summertime. Daytime is worse: the sun beating down mercilessly upon the landscape withers life, sears the air, and sucks moisture out of rocks. Temperatures often top 100 degrees F, and water is scarce and hard to come by—an irony, since so much of the landscape, from the bright salt plains to the rugged hills and the caves that honeycomb them, was shaped by ancient water.

Hardy plants like pickleweed, prickly pear, and desert parsley that dot the landscape are exploited by kangaroo rats, jackrabbits, deer mice, and chipmunks—creatures that are themselves eaten by bobcat, coyote, kitfox. Human beings appeared here soon after their arrival in the New World, settled in to stay, and managed to survive down through the centuries, sometimes with considerable difficulty. The records of repeated occupations are found in the dry caves that pockmark the hills, in thick layers of sediments laid down by processes both natural and artificial.

The granddaddy of all the caves, in terms of richness, age, size, and history of archaeological scrutiny, is Utah's Danger Cave.

Danger Cave lies a mile northeast of the city of Wendover on the western edge of the Bonneville Salt Flats, a bright alkaline wasteland that marks the former extent of Pleistocene Lake Bonneville. All that remains of Lake Bonneville today is the briny expanse of the Great Salt Lake far to the east. The cave's outward appearance belies its significance: all that shows is an angular cleft in a limestone outcrop near the base of a craggy hill. The cave itself was carved out of the hillside by wave action as the waters of Lake Bonneville rose during the initial period of the last Ice Age. It was inundated for thousands of years until, with the passing of the Ice Age, the waters receded and the area grew increasingly arid. By about 11,500–12,500 RCYBP (about 13,500–14,500 CALYBP), the cave was exposed and dry. For thousands of years thereafter spring-fed wetlands dominated the region near the cave entrance. It was these wetlands that made Danger Cave attractive to local nomads. In conjunction with

# DANGER CAVE

## *A haven in the heart of the desert*

Mother Nature, they filled the cave from top to bottom with sediments accumulated over millennia of occupations.

### **A site that yields its secrets reluctantly**

The cave was originally known as "Hands and Knees Cave" because of the posture necessary to enter it. Archaeologist Elmer Smith renamed it in 1941, when a rock fall terminated his field session for that year—and nearly terminated him. As far as Smith could tell, the "Danger Cave" was nothing more than a shallow rockshelter protected by a tiny overhang, no different from dozens of other sites in the area; only much later was its vast extent realized. Smith conducted what Jesse

Jennings termed "essentially a sampling operation," digging a series of pits and trenches under the overhang. He encountered deposits containing massive amounts of vegetable fibers in the upper strata, and continued digging until he hit beach gravels about 3 m (about 10 ft) below the surface.

Smith's most interesting finds were two points, initially identified as "Folsom-like," recovered

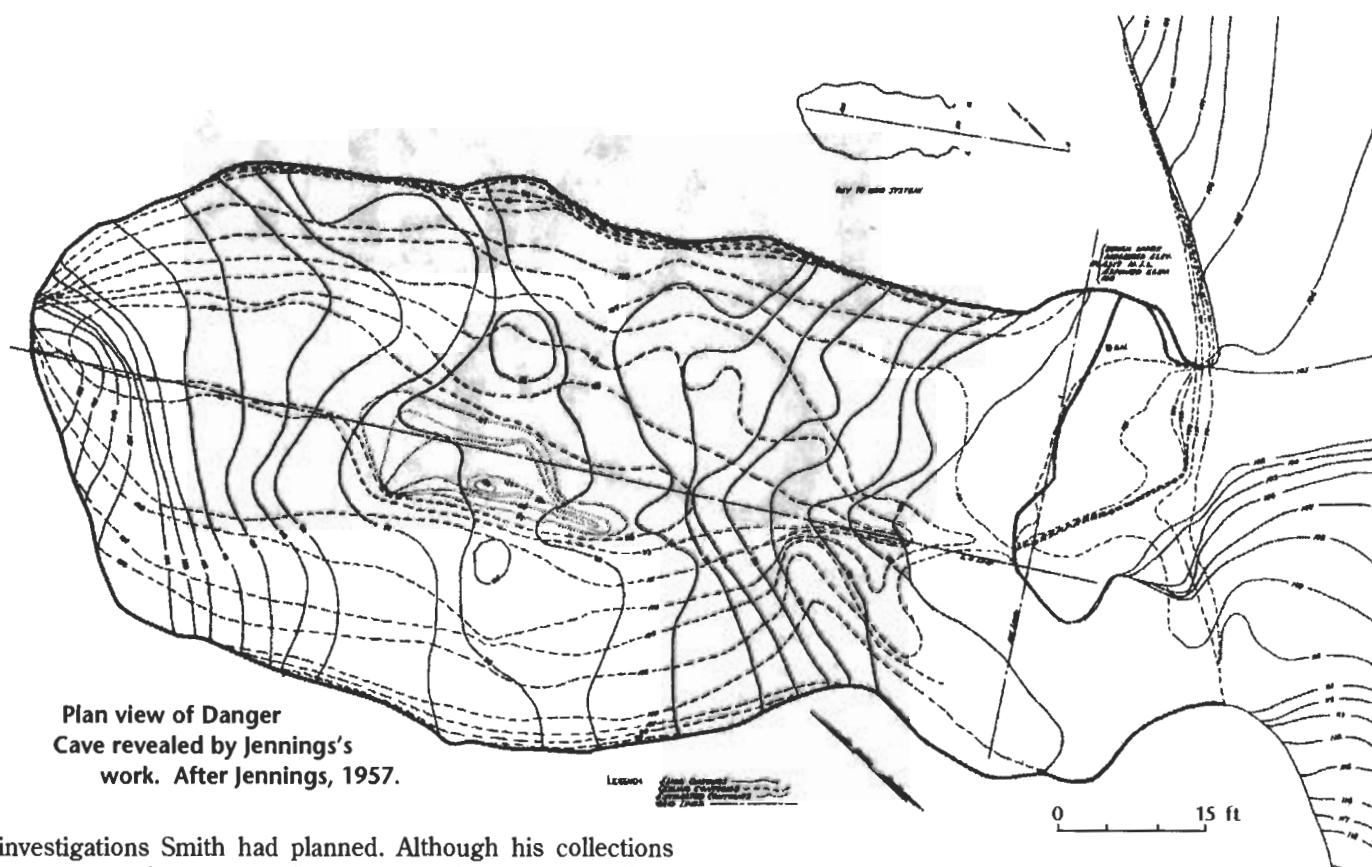


DAVID MADSEN AND DAVID RHODE

### **The entrance to Danger Cave.**

from the lower levels. These points disappeared shortly thereafter, but one was later recovered. According to David Rhode of the Desert Research Institute, to modern eyes it doesn't much resemble a Folsom point. "It may be a concave-based lanceolate point that dates to the early Holocene, but it's not specifically Folsom," Dr. Rhode states. "We have hardly any Folsoms in the eastern Great Basin at all."

Unfortunately, World War II interfered with any further



investigations Smith had planned. Although his collections were retained, many of his notes and drawings were lost. Jennings, who later attributed provenience to most of Smith's finds, estimated that as many as 25 percent of the proveniences were either doubtful or simply wrong. Subsequent pothunting muddled the record even further.

In the late 1940s Jennings selected Raven, Juke Box, and Danger caves as sites for his University of Utah summer field school in archaeology. Danger Cave proved the most fruitful

digging stirred up so much dust it severely affected visibility and breathing. Beneath the dusty surface sediments and vegetation

was a cemented calcrete layer, apparently formed when a fire swept through the cave and reduced plant matter to an ash that solidified when mixed with carbonate-charged groundwater. Under the calcrete was a sandy eolian deposit, characterized by copious mountain sheep droppings, that overlay beach sands and gravels. At the very base of the deposits in the back of the cave were banded clays that directly

contacted and predated the beach deposits.

Difficult as the field conditions were, they were worth the reward: the exquisite dryness of the cave and its infilling with fine sediments preserved an archaeological record unequalled in the region. Not only did Jennings and his crew unearth the chipped

and ground lithic objects they expected to find, they also uncovered a large quantity of perishable organic artifacts, all of which provided valuable information about paleoenvironments

Two views of the stratigraphic profile exposed during Jennings's excavations.

by far. In 1949 Jennings used a dragline to carve a deep trench across the talus slope blocking the cave mouth. This served two purposes; it gave him an excellent stratigraphic profile to examine, and it simplified removing backdirt from subsequent excavations. Systematic excavations were conducted in 1951 and 1952, with limited follow-up work in 1953. Removing interior sediments eventually exposed a chamber 60 ft wide by 120 ft long.

Jennings discovered the upper strata at Danger Cave were composed of vegetable-fiber mats embedded in eolian silts;



and prehistoric subsistence. Among these objects were bone tools; remains of basketry made of tule and willow; net bags as finely made as anything constructed by modern machines; cordage of various types and styles; twisted rodent and duck skin, probably from clothing or bags; and ecofacts galore. Thick mats of pickleweed fibers were repeatedly encountered. At first it was thought these might have been used as floor coverings, but later evidence suggested they represented instances in which large amounts of pickleweed were gathered and later threshed on site to recover their small edible seeds.

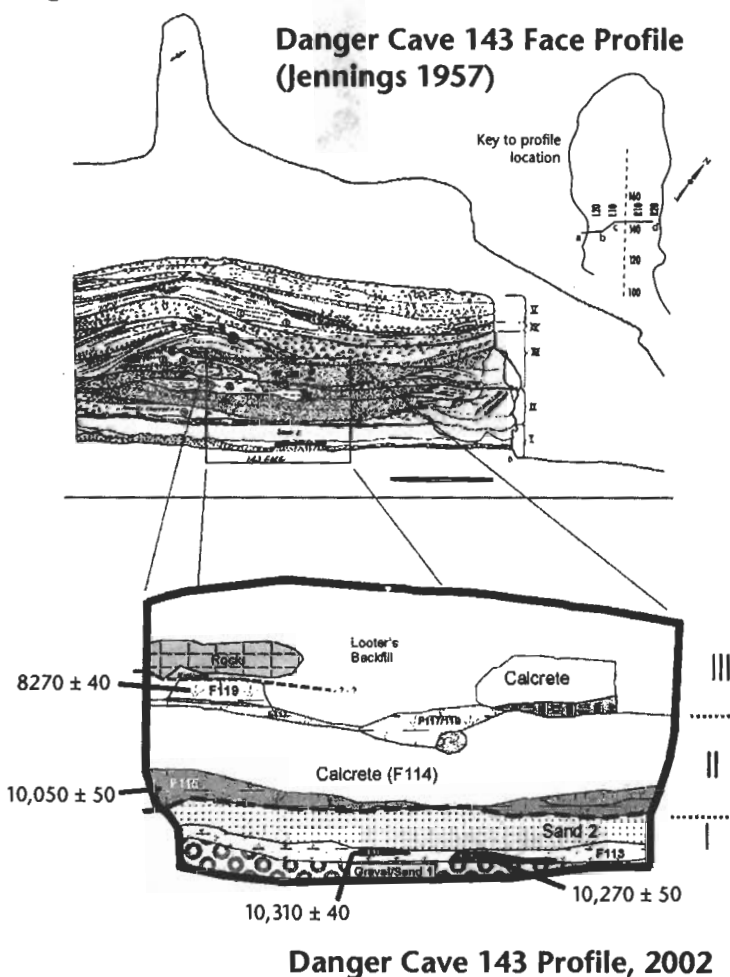
Finally, at the base of the excavations just above beach gravels, Jennings found six small hearths. Three were sufficiently well preserved to yield significant amounts of charcoal. Using an exciting new dating method, radiocarbon, to date his materials, Jennings accumulated a suite of 12 radiocarbon ages ranging from about 1930 to 11,150 RCYBP. These, with the other data he collected, provided a clear record of human occupation of the site through time and chronicled climatic changes in the region.

After analyzing his data, Jennings concluded Danger Cave had been occupied repeatedly by groups of fewer than 25–30 foragers. As you would expect, occupations waxed and waned as local wetlands prospered and shriveled. The data he collected there and elsewhere led to his definition of the Great Basin Desert culture: a sparse population of small nomadic groups that, for most of Great Basin prehistory, roamed the area eking out an arduous subsistence by collecting whatever food resources were available. Later cultures, like the Fremont culture of 1,500–1,700 yr B.P., were merely elaborations of the basic Desert Culture model with a bit of agriculture thrown in.

### Sharpening the focus with modern methods

In 1986, a multidisciplinary team of researchers led by David Madsen of the Utah Geological Survey arrived at Danger Cave determined to refine the chronology of the site and get a better grasp of changes in resource use through time. After first isolating a 2-by-2-m column (about 6½ ft on a side) of intact sediments near the front of the cave, they mapped the stratigraphy in great detail—then removed the entire column and took

it all to the laboratory. There they broke it up into various constituents, which they sent to specialists. Rhode examined (and is still examining) plant remains. “The preservation was wonderful back to about 7500–8000 years ago,” he recalls, “but degraded beyond that, probably because the column was too close to drip line.” Clearly, they needed to go back and get more data.



They revisited Danger Cave in the summers of 2001 and 2002, with the assistance of University of Nevada–Reno field school students. Few intact deposits remained, but the team was able to isolate a small section of intact materials. During the course of the excavations, they encountered the back walls of Jennings's excavations. “Because Jennings's profile drawings were so good, we could tell exactly where we were,” says Rhode. “We were able to get materials from well-preserved strata and were able to get much better dates than he did.”

Things had changed since Jennings's day. By 1986, the upper 40–50 cm of deposits at Danger Cave

**Stratigraphic profile exposed during the 1986, 2001, and 2002 investigations compared with Jennings's stratigraphy. (All dates are in RCYBP.)**

was nothing but dusty pothunter backfill. Beneath lay a layer of rocks and then the cemented calcrete ash, which the pothunters were unable to penetrate; the intact deposits came from these levels. The excavations bottomed out on the gravel deposits of Pleistocene Lake Bonneville. Although the Madsen/Rhode team recovered few lithic artifacts and basketry remains, they struck a mother lode of abundant human coprolites and subsistence-related ecofacts including tule rhizomes and fibers, seeds, stems, and other matter from a variety of plants. Pickleweed was a common find; Dr. Madsen believes the occupants brought whole branches into the cave and let the seeds ripen, then processed them on the spot. In the uppermost deposits unearthed in 1986 were found a few grains of domesticated wheat that suggest a historic occupation of the site, but exactly when is uncertain.

Rhode and Madsen conclude that Danger Cave occupants were primarily foragers, although some later visitors might have supplemented their diets with maize and other domesticated

Significant Great Basin sites: 1 Bonneville Estates Rockshelter; 2 Danger Cave; 3 Hogup Cave; 4 Deer Creek Cave; 5 Sunshine; 6 Smith Creek Cave; 7 Tule Springs; 8 Calico; 9 Henwood, Roger's Ridge, and Awl; 10 China Lake; 11 Tonopah; 12 Spirit Cave; 13 Last Supper Cave; 14 Dietz and Tucker; 15 Nials; 16 Buffalo Flat; 17 Connley Caves; 18 Fort Rock Cave; and 19 Newberry Crater.

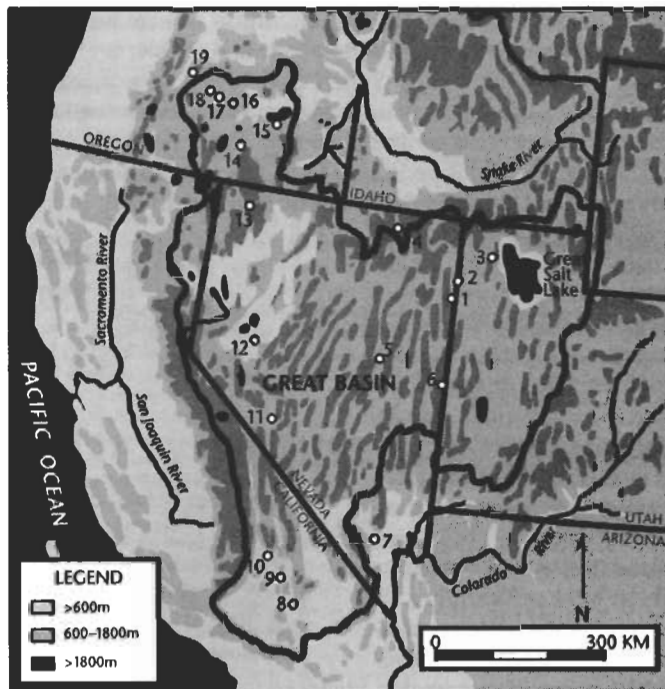
crops. It's hard to say much more than that today, since they're still looking at earliest deposits and have yet to tie what they've seen into evidence of subsistence patterns observed higher in the stratigraphic column. It's clear the state of local wetlands was enormously important in determining subsistence tactics. Some periods seem to have been dominated by pickleweed use, others by tule reed. Even the activities of later visitors were recorded in the Danger Cave archeological record. Indeed, the 1986 excavations revealed what Rhode lightheartedly calls "the archaeological records of the previous archaeologists"—Jesse Jennings's beer cans and Elmer Smith's canteen.

Ultimately researchers confirmed Jennings's dates with modern methods and solidified the site's chronology. With further analysis of biological material, Rhode, Madsen, and their colleagues will continue to fine-tune our understanding of the paleoenvironmental and archaeological history of Danger Cave and the Great Basin.

### An uncertain future

Today Danger Cave is a National Historic Landmark, the centerpiece of Danger Cave State Park. A barrier of thick metal bars prevents entry to the site, a testament to the extreme measures conservationists must use to prevent depredation by vandals and pothunters. It may not be enough. In 1999 pothunters broke through a similar gate at nearby Juke Box Cave, and in early 2003 two teenagers pried apart the bars of the new gate at Juke Box with a car jack so they could vandalize the petroglyphs there. Despite our best efforts, Danger Cave may not be able to withstand the ingenuity of those determined to destroy it. 🐾

—Floyd Largent



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## Kennewick Man Ruling Defended in Court

*continued from page 11*

Archaeological phases, according to the OAC, are not equivalent to tribes, ethnic groups, or even biological populations. They are merely subjectively defined groupings of artifacts created so archaeologists can compare the material culture of one region or time period with that of another. Any differences or similarities identified in the artifacts are not necessarily indicators of the degree of cultural affiliation. Groups can be unrelated and yet share elements of material culture, or be closely related and yet use dissimilar artifacts.

The DOI's assignment of Kennewick Man to the Windust or Cascade phases is based solely on the presence of a Windust/Cascade spear point lodged in his pelvic bone. The point may or may not be a Windust/Cascade point, but the person who thrust it into the body of Kennewick Man was likely an enemy rather than a member of his own group.

The claim that an unbroken chain of shared group identity can be traced across 9,000 years is implausible on the face of it. The OAC argues that nine millennia of momentous history, including episodes of extreme climate change, migration, warfare, and disease virtually precludes the possibility of a modern group's demonstrating a meaningful claim of cultural affiliation with Kennewick Man, or any remains of such antiquity.

### Texas Historical Commission

The Texas Historical Commission (THC) is an agency of the State of Texas that encompasses the State Historic Preservation Office (SHPO). According to the THC, if Jelderks' decision were overturned, the job of the Texas SHPO, as well as that of SHPOs in other states, would become much more difficult "if not impossible": "Without the ability to study human remains discovered on Texas lands, [the SHPO] will be unable to identify the groups, if any, with whom the Commission must consult about disposition of the remains." Moreover, without study of the remains, it is possible that some remains will be surrendered to the wrong groups. With regard to Kennewick Man, the THC argues that "important and unique scientific information will be lost forever if this specific skeleton is not studied." Although it acknowledges that some studies have been done, the THC notes that the government's studies were flawed or incomplete.

### Oral traditions as evidence for cultural affiliation


Andre Simic, Professor of Anthropology at the University of Southern California-Los Angeles, and Glynn Custred, Professor of Anthropology at California State University-Hayward, address the DOI's use of Native American oral traditions to support its cultural affiliation determination. These experts on folklore and oral tradition observe that oral narratives "are unlikely to retain any historical accuracy after 500 to 1000 years." They note that the creation stories the DOI relied upon are myths, "the least factually reliable type of oral tradition."

After analyzing the DOI's use of Native American oral traditions, they conclude that it ignored contrary or conflicting evidence and made no attempt to assess the reliability of the sources. They assert that the "Tribes' creation stories do not establish a 'reasonable connection' between them and Kennewick Man's remains" and that the DOI's acceptance of these myths as demonstrations of cultural affiliation constitutes "a misuse of folklore."

## COMING CONFERENCES

**September 27** The Longboot Symposium: A Paleoindian Conference, hosted by the Northern Alabama Chapters of the Alabama Archaeological Society, will be held at the Chan Auditorium, Administrative Science Bldg., of the University of Alabama at Huntsville. Featured are guest speakers David Anderson, John Broster, Albert Goodyear, Mark Norton, and James Dunbar, and the largest display of Tennessee Valley fluted points ever assembled.

Contact: Mark Cole at [ty4191@mindspring.com](mailto:ty4191@mindspring.com) or call (256) 216-9040 after 6:00 P.M. For information check Web site [http://myweb.cableone.net/kingorbit/longboot\\_symposium/](http://myweb.cableone.net/kingorbit/longboot_symposium/)

Send conference notices to Editor, Mammoth Trumpet, 93 Range Road, Blue Hill, ME 04614; e-mail [wordsmiths@acadia.net](mailto:wordsmiths@acadia.net) 

### Linguistics as evidence for cultural affiliation

Ives Goddard, a linguist with the Smithsonian Institution, and William Shipley, Professor Emeritus in the Department of Linguistics at the University of California-Santa Cruz, submitted a brief in which they demolish the linguistic arguments put forward in support of a shared group identity between Kennewick Man and the tribal coalition. They point to the present diversity of Native American languages and argue that there would have been even more diversity in the past. They cite evidence suggesting that more than 90 percent of the languages spoken in North America at the time of Kennewick Man have gone extinct. And even if Kennewick Man spoke a language that developed into one of the modern varieties, "the inevitable changes that would have occurred in his language over the past 8,000 to 9,000 years make it impossible to recognize a shared group identity between his group and the Tribal Claimants based on language." They conclude that the way the linguistic evidence has been used to support the determination of cultural affiliation is a "misuse of evidence."

### Department of the Interior's Response

In responding to Schneider and Barran's opening brief, as well as to points raised in some of the Friend of the Court briefs, the attorneys for the DOI state that the current position of the DOI is that Kennewick Man "should be treated as Native American remains without a qualified claimant." They limit their appeal to the issue of whether Kennewick Man is properly regarded as "Native American" for the purposes of NAGPRA. They appear to concede that their arguments for cultural affiliation are unworkable, but stand by their authority to interpret NAGPRA. This would appear to be a major concession, but they assert that even if Kennewick Man is not culturally affiliated with the tribal coalition, the decision as to whether to allow the remains to be subjected to further studies should be "a discretionary agency decision" and the case should be remanded once again to the government agencies for their consideration. Given the history of this case and the agencies' demonstrated hostility towards the scientists who were compelled to go to court just to be given a fair hearing, it is difficult to imagine that the agencies would approve further studies of these remains. In a chilling coda, the government attorneys note that, in any event, the DOI "must retain authority . . . to impose appropriate terms and conditions of study." If this interpretation is upheld, it means that, in spite of Jelderks's ruling and regardless of the result of the appeals process, the DOI could impose such onerous "terms and conditions of study" as to practically preclude the studies proposed by the scientists.

### Response of the Tribal Coalition

The attorneys for the tribal coalition do not acknowledge the weakness of the DOI's cultural affiliation determination. Instead, they assert that Jelderks erred by succumbing "to the allure of subjective and unproven scientific speculation" and threw himself "headlong into a scientific quarrel by reweighing the evidence and rejecting DOI's scientific conclusions." In other words, they claim that the government's scientists are every bit as smart as the scientists who are disputing the DOI's decision and that the court should therefore give the benefit of

the doubt to the government's experts. And, they further claim, even if there are a few "inconsequential, technical deficiencies," the court has no right to "fly speck" the DOI's decision-making.

Actually, the problems with the DOI's cultural affiliation determination are bigger than fly specks and the DOI cannot divorce itself from prior agency abuses by seeming to concede on one major issue, when, in practical terms, the concession costs them nothing. The amicus curiae briefs submitted by the Society for American Archaeology, the Ohio Archaeological Council, the Texas Historical Commission, Simic and Custred, and Goddard and Shipley demonstrate overwhelming scientific support for Magistrate Jelderks's decision. This is not a matter of one expert disagreeing with another over some arcane point of scientific trivia. The scientists who brought this case to trial and the scientists and scientific organizations who have submitted the amicus curiae briefs on their behalf are among the most renowned and respected in the world. In fact, for the most part, the scientists are not disagreeing with the work of other scientists, but with the DOI's repeated and deliberate misuse of scientific

evidence to support a pre-ordained, politically motivated decision.

### What's next?

The United States District Court of Appeals for the Ninth Circuit will now try to sort out this ugly custody battle. It seems unlikely that Magistrate Jelderks's well-reasoned decision will be overturned, but the Ninth Circuit Court will carefully weigh all the arguments and come to its own decision. When it does, the losers undoubtedly will appeal it to the United States Supreme Court. In the immortal words of Yogi Berra, "it ain't over 'til it's over," and this monumental, precedent-setting case definitely ain't over. 🐘

—Bradley T. Lepper

*The full text of Jelderks's decision, along with the text of all the Friend of the Court briefs and other court documents, can be found on the Friends of America's Past Web site [www.friendsofpast.org/](http://www.friendsofpast.org/) (where future updates on the appeals process also will be posted).*

## Rethinking Clovis Origins

*continued from page 14*

not available to be occupied by later peoples. Any artifact that gets found in the deep water, whether it's a flake, a core, a scraper, or even something like an oyster shell midden, is probably Clovis in age.

### From marine to terrestrial life style

Although Faught expects to find evidence of early Clovis people on the continental shelf, he doesn't think they retained their maritime adaptation for long. Assuming early Clovis people were on the continental shelf and had a maritime subsistence, then how did they adapt to big-game hunting, as the evidence at most Clovis sites indicates? According to Faught, that transition happens at the beginning of the Younger Dryas (approximately 10,900 to 10,000 RCYBP, or 11,800 to 12,900 CALYBP), when we see Clovis become widespread across the U.S. During the Younger Dryas, the climate returned to full glacial conditions, accompanied by a re-advance of glaciers and a lowering of sea levels that left large areas of the continental shelf exposed.

"If the sea level goes down, you lose your coastal resources," Faught explains. "The landscape that's exposed is highly salinated. So the marsh plants can't grow there and you don't get the formation of the rich estuarine environments. The shell communities are also depleted." It is this abrupt loss of the rich estuarine environments that Faught thinks pushed Clovis people into the interior, where they began to focus more on hunting and began to consume Pleistocene megafauna, including mastodons and mammoth. "That is why we see Clovis appear so abruptly inland and the economy is focused on big-animal resources right from the beginning."

However, Faught doesn't think he'll find the earliest evidence of Clovis on Florida's continental shelf. Because Clovis is so frequent and early in Texas and southeastern New Mexico, Faught thinks Clovis may have originated in this area. "In fact," he says, "one of the best places to go for early Clovis, from my perspective, is off the coast of Texas. Because the earliest sites are up the Brazos River, I'd follow the Brazos out into the Gulf of Mexico and look on the formerly exposed continental shelf."

For the foreseeable future, however, Faught is committed to his work along Florida's ancient shoreline. Despite cuts in promised funding from the State of Florida, Faught says cheerily, "I won't stop going out there. I'm too curious. In all honesty, that's the bottom line. I want to know." 🐘

—Ariane Pinson

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### Suggested Readings

- Anderson, D. G., and K. E. Sassaman 1996 *The Paleoindian and Early Archaic Southeast*. University of Alabama Press, Tuscaloosa, Ala.
- Milanich, J. T. 1994 *The Archaeology of Precolumbian Florida*. University Press of Florida, Gainesville.