



MAMMOTH TRUMPET

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Center for the Study of the First Americans
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At last, Folsom and Clovis Sites in Kansas



TRAVIS HEYING

And what sites they are! When a highway construction crew contoured the banks of a dry wash in northwestern Kansas, they uncovered mammoth bones. Now principal investigators Steve Holen of the Denver Museum of Nature & Science and Rolfe Mandel, of the Kansas Geological Survey and Executive Director of the Odyssey Archaeological Research Fund, have discovered that in the terminal Pleistocene the channel was a robust spring-fed stream that attracted mammoths and camels—and Paleoamerican hunters. Not only have Drs. Holen and Mandel found artifacts from Folsom and Clovis cultures, they may have evidence of even earlier Americans. These mammoth bones Mandel is uncovering bear green bone spiral fractures that suggest the work of human butchers. The exciting part is that the bones date to 12,200–12,300 RCYBP, *fully 1,000 radiocarbon years older than the commonly accepted age of Clovis!* Our story about the Kanorado locality, the first intact Folsom and Clovis sites found in Kansas and Nebraska, starts on **page 6**.

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Dept. of the Interior Stands Up for Science

IN THE MOST SURPRISING development to date in the Kennewick Man case, an imbroglio that has not suffered from a lack of surprises, the U.S. Department of the Interior (DOI) has reversed its long-standing position on the definition of "Native American" for the purposes of the Native American Graves Protection and Repatriation Act (NAGPRA) and on whether Kennewick Man should be considered a "Native American" under that definition. Paul Hoffman, Deputy Assistant Secretary for Fish, Wildlife, and Parks, issued a statement on behalf of the DOI in which he asserted that while "NAGPRA should protect the sensibilities of currently existing tribes," in those instances "where remains are not significantly related to any existing tribe, people, or culture they should be available for appropriate scientific analysis."

The context for this statement was an oversight hearing on NAGPRA before the Senate Committee on Indian Affairs held 28 July 2005. This hearing was convened to hear testimony on a proposed amendment in the statute. In response to the decision of U.S. Magistrate Jelderks that Kennewick Man was not "Native American"

can" for the purposes of NAGPRA (MT 19-1, "Major Decision: Kennewick Man Case") and the upholding of that decision by the U.S. Court of Appeals for the Ninth Circuit (MT 19-2, "Kennewick Man decision upheld by Court of Appeals"), Sen. Ben Nighthorse Campbell (R-Colo.) introduced a "technical corrections" bill (S. 2843) that included a provision to change the NAGPRA definition of "Native American" from "of, or relating to, a people, culture, or tribe that is indigenous to the United States" to "of, or relating to, a people, culture, or tribe, that is *or was* indigenous to the United States" (MT 20-1, "Kennewick Man Still in Legal Limbo"). That bill died without a vote by the full senate, but was revised in March 2005 by Senator John McCain (S.536). The proposed definitional change, however, was found to be so controversial that it was removed from the bill, and Sen. John McCain is now considering presenting the amendment as a stand-alone bill. The hearing was convened to hear testimony over this proposal.

The list of invited witnesses included Hoffman representing the DOI; Paul Bender, Professor of Law at Arizona State University; Walter Echo-Hawk, Senior Staff

INSIDE

6 Following the trail of ancient soils on the Kansas High Plains

At the Kanorado sites investigators have found mammoth and camel bones, Folsom and Clovis artifacts, and paleosols that may lead them to even earlier peoples.

11 Championing the coastal route theory

A Colorado scientist argues that the first immigrants from Northeast Asia may have arrived by paddling instead of walking.

14 Earning a living from the sea in early Peru and Chile

While North Americans were hunting megamammals, coastal South Americans were already harvesting sea life. The first of a two-part series.

4 Rob Remembered by a scientist and former student

Attorney for the Native American Rights Fund; Patricia Lambert, representing the American Association of Physical Anthropology; Paula Barran and Alan Schneider, attorneys representing the Friends of America's Past; Keith Kintigh, representing the Society for American Archaeology; and Van Horn Diamond, Hopolulu, Ha-

waii. Only invited witnesses were allowed to testify, but many individuals and organizations sent letters to Sen. McCain and the committee expressing their views. A few of those opposed to the proposed amendment were attached to Barran and Schneider's written testimony.

In addition to stating that the DOI did not support the proposed amendment to NAGPRA, Hoffman also spoke in support of the decision of the Ninth Circuit Court in the Kennewick Man case. This was a dramatic reversal, since the DOI formerly supported an interpretation of NAGPRA that encompassed ancient human remains and the DOI was on the losing side in *Bonnichsen v. the United States of America*.

Fixing NAGPRA, or stealing the past?

Bender presented a written statement that he originally submitted to a 2004 Senate hearing on the American Indian Religious Freedom Act (MT 20-1, "Kennewick Man still in legal limbo"). Bender argued that the decision of the Ninth Circuit was "a serious error of statutory construction" and that adding the words "or was" to the definition of "Native American" in NAGPRA would clarify what he claimed was the original intent of Congress to encompass all human remains found in the U.S., regardless of age.

Echo-Hawk agreed with Bender and, while provocatively referring to culturally unaffiliated human remains as "unknown Native American dead," offered his support for the proposed amendment, stating that it was "necessary to guide NAGPRA implementation efforts along the path set by Congress in 1990."

Barran and Schneider addressed the issue of what Congress originally intended by dryly observing that if the drafters of the statute truly meant to include ancient human remains under NAGPRA, then "they went to great efforts to keep it to themselves." Referring to a letter from attorney Ryan Seidemann, which they attached to their statement, they asserted that "it was not the intent of Congress to allow tribes to claim things that have no verifiable connection to living Americans." Indeed, Seidemann's analysis of the history of NAGPRA revealed that "Congress had three major areas of concern when it enacted NAGPRA: (1) the repatria-

tion of the remains of recently deceased Native Americans, (2) reparations for the sometimes dubious collection practices of early anthropologists, and (3) the protection of the scientific study of ancient America." He found particularly relevant a statement made by Sen. Melcher, "the author of the original Senate repatriation bill." In a 1987 hearing, Melcher said, "[Human] remains were also obtained by archaeologists. In general these are older remains, gathered for study to piece together the millennium of our unknown

past. We do not intend in any way to interfere with this study and science in the bill."

Bender and Echo-Hawk regard the proposed amendment to NAGPRA as addressing a loophole that has been used to thwart the implementation of an important human rights law. Barran and Schneider counter that "it is not a human right to control the disposition of remains over which one has no connection." Indeed, they assert that ancient remains, such as Kennewick Man, are properly



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

—Michael R. Waters, Director

viewed as "the cultural patrimony of everyone in this country" rather than the inheritance of any particular modern Indian tribe. They concluded their statement with the claim that the attempt to recraft NAGPRA in the terms proposed by Bender and Echo-Hawk was a blatant attempt to "steal the past."

The SAA and AAPA Speak

Kintigh, speaking on behalf of the Society for American Archaeology (SAA), stated that "SAA supports the proposed amendment," thus reiterating that organization's support for including ancient human remains under the NAGPRA umbrella. Although consistent with the SAA's previous statements (MT 20-1, "Kennewick Man still in legal limbo"), this position appears, nonetheless, surprising and contrary to the interests of a scientific understanding of North American prehistory. Kintigh did offer the hope that such ancient human remains generally would not be subject to repatriation, since modern Native American tribes would not be able to meet the more restrictive standard of demonstrating "cultural affiliation." But, as Barran and Schneider point out in their statement, this hope is naive at best:

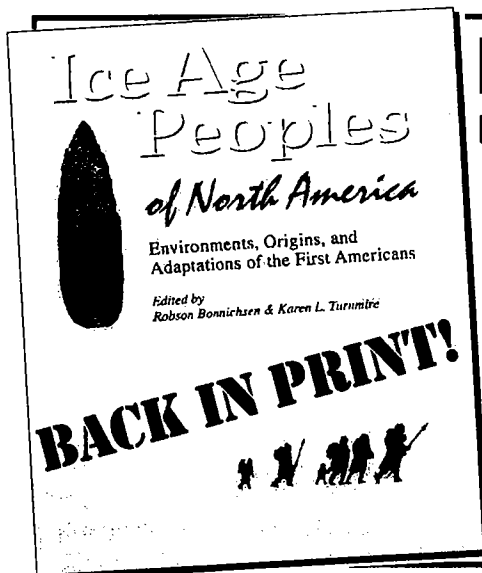
The Secretary of the Interior has been given the authority to approve federal agency and museum dispositions of culturally unaffiliated remains. This authority has already been used to

might be prudent to delay passage of the proposed amendment "until regulations dealing with culturally unidentifiable human remains are promulgated."

It is not clear to what extent the statements of the SAA and AAPA reflect the opinions of the memberships of these groups, but several letters attached to Barran and Schneider's statement indicate that some archaeologists and physical anthropologists do not support the proposed amendment. For example, C. Loring Brace, Kent Flannery, Joyce Marcus, and Henry Wright, all renowned scholars from the University of Michigan, jointly argued that the McCain amendment would "erect hasty and ill-conceived barriers to scientific investigation of prehistory." Ronald Mason of Lawrence University and Henry Glynn Custred, Jr. of California State University-East Bay asserted that the effect of the amendment would be "to privatize our national, indeed the common human, patrimony represented by the Kennewick Man skeleton and other ancient remains that until now the government has traditionally protected."

Native American reactions

Native Americans have responded to the DOI's radical shift in position with understandable dismay. Echo-Hawk, in an article posted on Indianz.com, called the DOI's statement "a sad re-



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THIS REMARKABLE COLLECTION of 19 papers was first published by CSFA in 1999, and the scholarship is just as current today. In this one book you'll find in-depth reports on such topics as *Ice Age environments of northern Eurasia with special emphasis on Beringia* ■ *Periglacial ecology, large mammals, and their significance in human biology* ■ *Pleistocene peoples of Japan* ■ *Prehistory of the Great Basin/Snake River Plain to about 8,500 years ago.*

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allow hundreds of unaffiliated remains to be transferred from public museums to tribal collections, and many of them were as much as 5,000–8,000 years old.

Why, then, should scientists support changing the law so that such decisions can be subject to the vagaries of changing political administrations?

Lambert spoke for the American Association of Physical Anthropologists (AAPA); her statement also offered support for the McCain amendment: "We . . . do not object to the insertion of 'or was' into the current definition [of 'Native American'] to clarify its meaning." Unlike the SAA's unqualified endorsement, however, the AAPA's statement reflected some concern over "attempts by the DOI to extend the concept of cultural affiliation to encompass very ancient remains with no demonstrable relationship to any modern tribe." As a result, Lambert suggested it

treat from its earlier position." Susan Shown Harjo, writing in *Indian Country Today*, was more strident. In her column entitled "How Many Dead Indians Will Satisfy Feds and Scientists?" she characterized the positions of the DOI "and the scientists" as "reminiscent of the days when the United States would make treaties, then break their promises because they wanted even more land." Far from gratefully acknowledging that the SAA and AAPA supported the amendment, she characterized their testimony as "careful," implying pusillanimity, or at least insincerity. She concluded that "no amount of bodies . . . will satisfy the feds or scientists who are opposing the NAGPRA recalibration" and called on Congress to "stop this sacrilege and indecency" by adopting the McCain amendment.

Harjo quoted from a statement by Armand Minthorn, trustee of the Confederated Tribes of the Umatilla Indian

IFIRST RAN INTO Rob Bonnicksen, almost literally, in the breezeway between North and South Stevens Hall at the University of Maine almost three decades ago on a September morning in 1977. I was a new graduate student in the Institute for Quaternary Studies (now the Climate Change Institute) and Rob had just taken a position as Assistant Professor with a joint appointment in the Institute and the Department of Anthropology. We spoke briefly before rushing off in opposite directions; he was to be my thesis advisor. Little did I realize at the time how much Rob would influence my thinking about archaeology; we remained friends until his unexpected and untimely death on December 24, 2004.

Rob's passion was the study of the First Americans (the Paleoindian period as it is commonly referred to among archaeologists). He wanted to know who were the first people to inhabit North America? Where did they come from? How did they live? The debate was raging at the time over whether Clovis was the earliest Native American culture or whether people had migrated into the New World many millennia before 12,000 years ago. Rob's research on broken bones of extinct animals recovered from Old Crow Flats in the Yukon supported his argument for an earlier migration of people from Asia into North America. Rob loved involving himself in controversial topics—a philosophy he practiced to the end of his career.

In 1977, Maine seemed an unlikely place for Rob to continue his research interests. There were no known Paleoindian period sites in the state. The conventional wisdom held that, if Paleoindian-period people had lived in Maine,

then they likely had colonized the coastal plain at a time when it had extended further out onto the Continental Shelf. Decades of geological and archaeological field investigations had shown that the coast had been intensively utilized for at least 3,000 years or so. It was presumed that archaeological sites from earlier time periods had likely been drowned by rising sea levels.

Armed with a small research grant and a

we followed Rob around on his seemingly aimless wanderings. The most memorable part of that summer for me was watching Rob stagger and stumble through overgrown clear-cuts, suddenly pause in some unlikely looking spot, look around for a few minutes, and then pronounce, "Dig here!" Often, we were not on the margin of a stream. A lake could be miles away. Often we weren't really sure

Remembering Rob

by Rick Will

group of students eager for summer employment, Rob headed to the northern interior of Maine in 1978 in search of evidence for the First Americans. Most of us on his team were skeptical that we would find such evidence. We lived in tents at various locations: Mooseleuk Lake, Round Mountain Pond, and Munsungun Lake, and we subsisted on a diet largely composed of beans and hot dogs, white bread and bologna. We were under constant assault by swarms of black flies and mosquitoes. True, the scenery was spectacular and moose were abundant in the days before hunting them was legalized, but we often felt lost as

where we were. And yet, time after time, a few shovelfuls of earth would yield flakes. Rob simply had a remarkable ability to find archaeological sites. None of us knew how he did it, but I still envy and marvel at his uncanny "nose" for finding sites in places no one ever thought to look.

We found lots of new sites that summer, but did not find the diagnostic artifact (a fluted projectile point) we were seeking. Of course none of us, except for Rob, actually believed that people of the Paleoindian period lived in the northern interior of Maine more than

Reservation, stating that the Umatilla Tribes support the amendment. Since the Umatilla were one of the tribes that sought to claim for reburial the remains of Kennewick Man, whom they referred to as the Ancient One, their position is hardly surprising. Minthorn attributed the unfavorable decision by the Ninth Circuit court to a legal "technicality" that the McCain amendment would fix. Minthorn reacted particularly strongly to the DOI's decision to pay attorney's fees from NAGPRA grant funds:

Adding final insult to injury, to take the money away from tribes and museums who implement NAGPRA to pay the attorneys fees to those who sought to and succeeded in eviscerating the law is beyond the pale. Tribes and museums need these grants to pursue repatriations of ancestors long-denied their rightful home in the earth.

He did not specify the particular biological or cultural connections that would have allowed the Umatilla to speak authoritatively as to why Kennewick Man's

"rightful home" was, indeed, in the earth. Indeed, it was the absence of evidence for such a connection, and not a legal technicality, that compelled Jelderks and the Ninth Circuit Court to reject the government's assertion that the Umatilla, along with the other members of the tribal coalition, were the lawful inheritors of the remains of this visitor from such a remarkably ancient time.

A delicate balance

Seidemann's painstaking analysis of the

10,000 years ago. Convinced that they did, Rob sent James McCormick (another graduate student) and me back north to Munsungun Lake one cold October weekend in search of the elusive diagnostic artifact. James and I made our way to a high terrace between Munsungun and Chase Lakes where Rob had instructed us to dig. It was cold and there were snow squalls that afternoon. James was digging and I was screening. We found what we were looking for in the third testhole: the base of a fluted point. I could barely conceal my excitement and disbelief and James looked equally amazed. After discovering the other half of the point in the same testhole, we headed back to Orono to share our discovery with Rob. We knocked at his door in the early evening. When Rob opened it, I extended the point to him on my open hand. He stared at it for a moment and then declared, "Holy horse pucky!" At that moment, I added yet another of many colorful phrases that I got from Rob to my vocabulary, while Maine embarked on a whole new direction in archaeological investigation. There are many more stories I could reminisce about my time with Rob. I thank him for introducing me to "taphonomy," a "ten dollar" concept that has guided much of my approach to understanding the archaeological record ever since. I want to close with one personal story that I have rarely shared.

Rob and I were flint-knapping one evening in his basement in 1979. Christmas was only days away. I was a poor graduate student and often was forced to make choices on how best to spend my limited funds. The immediate decision I had just faced was whether to pay my

health care premium or purchase Christmas presents. I had chosen the former, which had left me a little depressed about the upcoming holidays. That evening, after breaking at least a half dozen stone knives, Rob walked with me to the door where he handed me a \$250.00 check and told me it was a loan to buy Christmas presents. When I protested, he joked, "You can pay me back some day when you're rich and famous."



RICHARD T. WILL


While years later, neither rich nor famous, I did eventually pay him back. Wherever Rob went he sparked controversy and challenged conventional thinking. He was always forward looking; some of his ideas were quite radical; all of them were original and progressive. But in my mind I'll always remember him for not only sharing his money but most importantly his skills, knowledge, time, and friendship.

About the author In this tribute Rick Will, Northeast CRM Operations Manager for TRC in Ellsworth, Maine, recalls his long-standing friendship with CSFA founder Rob Bonnicksen. Four years ago we introduced you to Dr. Will, a scientist and successful businessman who never lost sight of his responsibility to educate the public (MT 16-3, "A Professional Archaeologist"). (He sold his former company, Archaeological Research Consultants, Inc., to TRC Customer-Focused Solutions, which conducts cultural resources management nationwide.) Will also coauthored with Rob "Radiocarbon Chronology of Northeastern Paleo-American Sites: Discriminating Natural and Human Burn Features," a meaty chapter in CSFA publication *Ice Age Peoples of North America*, which has been newly reprinted and is again available.

Rob Bonnicksen at the Pryor Mountains Archaeological Field School in southeastern Montana, codirected by Rob (University of Maine) and David Young (University of Alberta), 1979.

This remembrance appeared in the spring 2005 issue of the *Maine Archaeological Society Bulletin*.

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history of NAGPRA indicates that, contrary to Minthorn's accusation, it is the McCain amendment that would eviscerate the "delicate balance of human rights and scientific interests" embodied in NAGPRA. Hoffman's testimony affirms this conclusion:

We [the DOI] believe that NAGPRA should protect the sensibilities of currently existing tribes, cultures, and people while balancing the need to learn about past cultures and customs. In the situation where remains are not

significantly related to any existing tribe, people, or culture they should be available for appropriate scientific analysis. The proposed legislation would shift away from this balance.

According to the *Tri-City Herald*, Sen. McCain "was not pleased" with the DOI's change in position. He claimed the amendment was "consistent" with NAGPRA's original intent and implied that scientific studies of ancient human remains were among the "obscene" and "disgraceful" practices that NAGPRA was

enacted to prevent. Seidemann's review of NAGPRA's history contradicts this view: "Scientific study, especially of ancient human remains, when addressed in the congressional hearing, was intended to be expressly protected and preserved, *not* discouraged or banned."

The McCain amendment to NAGPRA clearly is controversial. Bender, Echo-Hawk, Harjo, and Minthorn feel it is needed in order to insure that the human-rights interests of Native Americans are

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ALL PHOTOS: DENVER MUSEUM OF NATURE & SCIENCE

Chris Wigda, doctoral candidate in anthropology at the University of Kansas, applies preservative to a large bison humerus at site 14SN101, 2005 season.

EVIDENCE THAT PALEOAMERICANS walked the plains of northwestern Kansas hasn't been found in the same abundance as in other places on the Great Plains—Clovis and Lubbock Lake, for example, and Scottsbluff and Gault. Not because scientists doubt that the evidence exists, since we know that the Kansas landscape in the terminal Pleistocene was lush grasslands that would have supported plentiful animals and attracted the people that hunted them. The problem is knowing *where* to dig. Any remains lie buried under several feet of deposits, the result of the continuous reshaping of the Plains ever since the Rockies were heaved up during the Tertiary. Although geoarchaeologists are trained to recognize likely sites that may harbor remains, luck unavoidably plays a major role in discovery on the largely featureless plains of northwestern Kansas. At the Kanorado locality, excavation of a now-barren stream during highway construction was the serendipitous event that showed archaeologists where to dig. After three seasons of excavating, principal investigators Steve Holen of the Denver Museum of Nature & Science and Rolfe Mandel, of the Kansas Geological Survey and Executive Director of the Odyssey Archaeological Research Fund, have recovered megafauna remains and artifacts of the Folsom and Clovis people that hunted them—and *possible evidence of an even earlier culture*.

Until Kanorado, no intact Clovis or Folsom site had been recorded anywhere in Kansas or Nebraska. Although isolated

Kanorado Sites

Paleoamericans on the High Plains of Northwestern Kansas

finds have occasionally been reported—a Paleoamerican point found on a gravel bar or turned up by a farmer's plow—securely dated sites simply didn't exist. Now there are three, and the promise of even more to be found. "The cluster of sites at Kanorado represents one of the most important archaeological finds in the High Plains," report Holen and Mandel, together with Jack Hofman and Jeanette Blackmar of the University of Kansas, in the 2004 *Geological Society of America Field Guide 5*, "and perhaps North America."

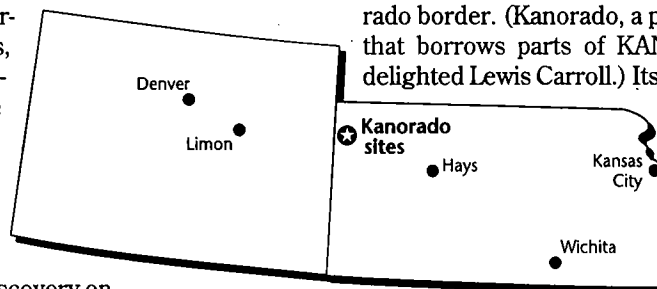
Land where mammoths and camels once roamed

The sites lie in pasture land outside Kanorado, a town in the northwestern corner of Kansas snuggled up against the Colorado border. (Kanorado, a portmanteau word coined by settlers that borrows parts of KANSAS and COLORADO, would have delighted Lewis Carroll.) Its altitude of 3,850 ft certainly qualifies it as High Plains country.

The locality consists of three sites in the space of a mile along Middle Beaver Creek. Today it's a draw, "no stream at all right now," Dr. Holen frankly states. Nowadays it's dry most of the

year and only carries runoffs from seasonal downpours. Between 11,000 and 12,000 radiocarbon years ago (about 13,000–14,000 calendar years), however, it was a dependable spring-fed freshwater supply. It may even have been ponded, a conjecture supported by the discovery of clam and mussel shells and pelican bones. Animals were attracted to it, and so were human hunters.

Its secrets might still lie undiscovered if not for the Kansas Department of Transportation (DOT). In the course of building a road in 1976, DOT workers channelized Middle Beaver Creek, cutting into and contouring its banks. Shortly thereafter the landowner discovered large bones eroding out of the bank and



reported the find to K. Don Lindsey, Curator of Paleontology at the Denver Museum, who recovered bones and a tooth from two mammoths. A sharp-eyed investigator, Dr. Lindsey noticed anomalies—a large cobble found with mammoth bone seemed out of place in a layer of fine sand, and spiral fractures and wear patterns on some of the bones didn't appear to be the result of natural processes.

Lindsey returned to the site in 1981 and found, in addition to *Camelops* vertebrae, more spiral-fractured mammoth limb bones.

In 2001 Holen, reviewing the Museum's Kanorado collection, noticed the unusual fracture and wear patterns on the mammoth bones. What especially caught his attention was a fragment of cortical limb bone with three facets, to him clear evidence of cutting with stone tools. With Dr. Hofman, he visited the locality the next year and recovered *Camelops* bones estimated to be of Clovis age, more mammoth bones, and—a heart-quicken-



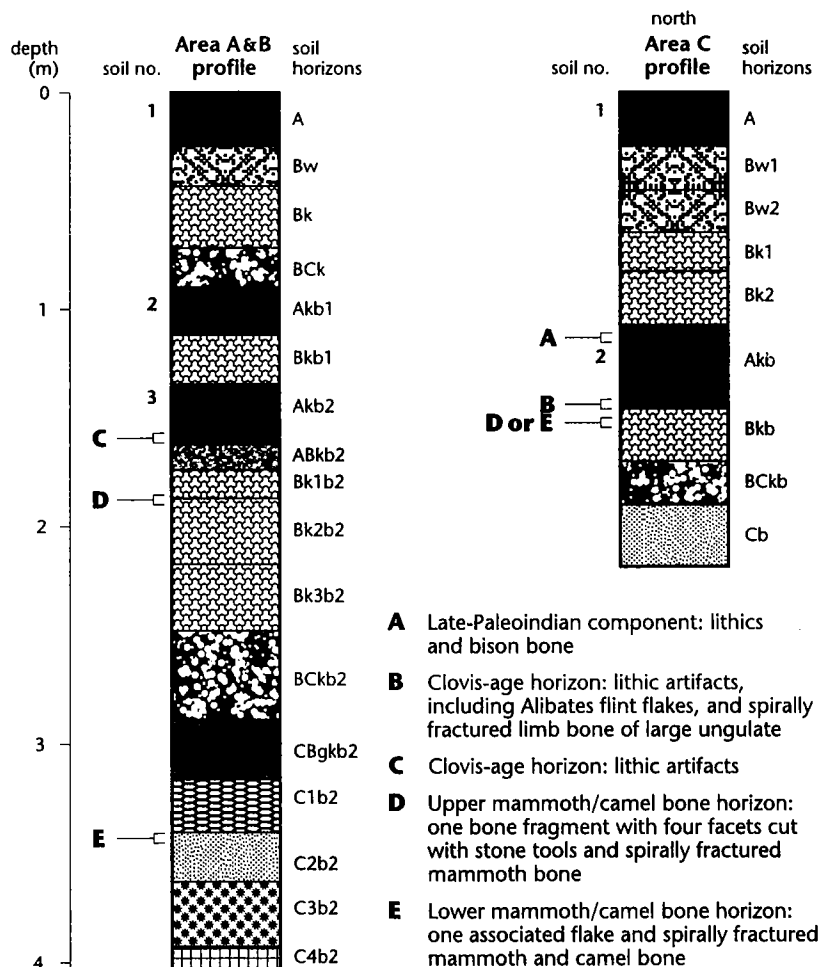
Mammoth vertebra from the lower mammoth–camel bone level at site 14SN105, 2005 season.

find—burnt bone fragments. But still no artifacts had been found at Kanorado.

Success finally came in 2003 at a site east of the original dig, where DOT workers had channelized another section of Middle Beaver Creek. A flint endscraper, which Holen instantly recognized as Paleoamerican, was found just below the soil stratum that had yielded *Camelops* remains the previous year; directly above it, in the *Camelops* stratum itself, were later found three quartzite flakes and a

retouched flake of silicified wood. This year at a different location, officially designated 14SN106, they opened up a much larger area and found a Folsom-age specialized-use area containing endscrapers and endscraper sharpening flakes. At yet another locality, 14SN101, Holen says, "We have at least two cultural horizons and possibly three. One of those has a date of 10,950 RCYBP. So we think we have a Clovis component there and probably also a higher Folsom component."

At site 14SN105, the location Lindsey investigated in 1976,

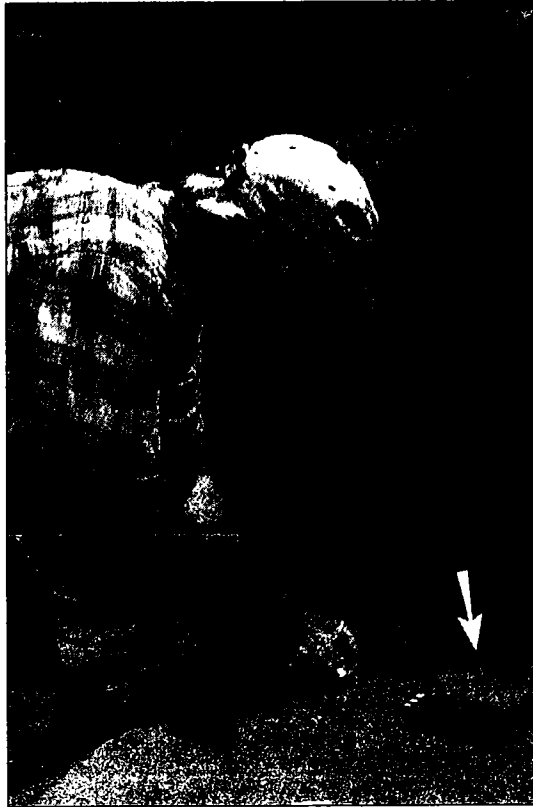


Steve Holen excavating in the Folsom level at site 14SN101, 2005 season. An endscraper is just visible on the pedestal (arrow).

recent finds are even more intriguing. In 2003 the team discovered a concentration of mammoth bones, some of them bearing spiral fractures—"green bone breaks," which can be caused by natural processes but more likely indicate human butchering activity—about 2½ m (8¼ ft) below the Clovis-age component. Moreover, a *Camelops* phalanx and fragment of pelvis were found among the mammoth bones; "There is no evidence of carnivore gnawing," write Drs. Mandel, Holen, and Hofman, "and we consider human action to be a likely explanation for bone modification." Two of the mammoth bones yielded radiocarbon dates of $12,215 \pm 35$ RCYBP and $12,375 \pm 35$ RCYBP, and a *Camelops* tibia from the same assemblage dated to $12,255 \pm 40$ RCYBP. Bearing in mind that the scientific community accepts 10,900–11,200 RCYBP as the age of the Clovis culture, we can understand why Holen, Mandel, and their colleagues are excited about their claim that the Kanorado sites have "great potential for providing new information concerning Clovis and possible pre-Clovis subsistence and mobility patterns on the High Plains."

At the third site in the Kanorado locality, 14SN106, a Folsom component was found. A few mammoth bones were also recovered; unfortunately, most of the skeleton apparently had been unearthed wholesale and trucked off during road construction. Holen understandably has mixed feelings about construction. "Construction is both good and bad for archaeology," he remarks. "It exposes new things, but it also hauls away a lot of the material." His sentiments, shared by the archaeological community, underscore the need for CRM. The lesson reinforced here is, If you want to

Materials from the Kanorado sites.
A, Folsom endscraper; B, faceted bone fragment from the upper mammoth–camel bone level at site 14SN105, 1981 season; C, Alibates flint artifacts from site 14SN101.



recover archaeological and faunal materials, dig with a trowel, not a backhoe.

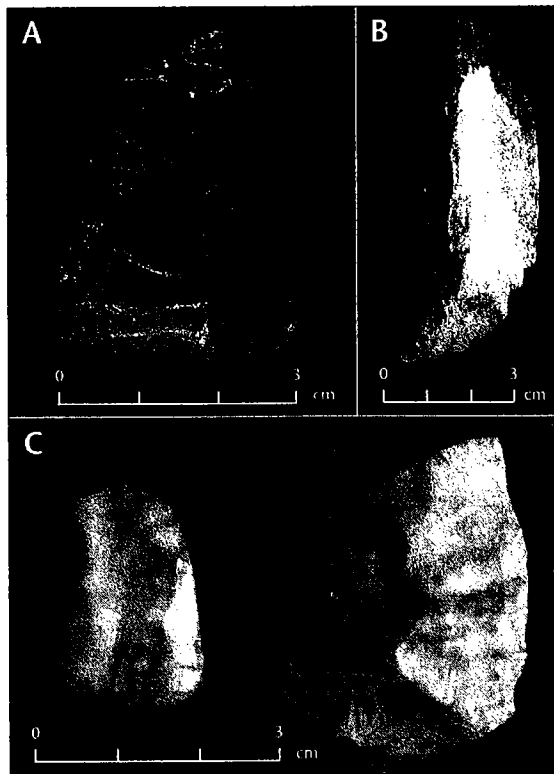
Ancient soil, "the yellow brick road"

When DOT workers dug into the bank of Middle Beaver Creek, they opened a window into ancient soils (paleosols) buried in valley fill beneath a terrace that extends over much of the Beaver Creek drainage network. Mandel has identified two soils—in places they merge into one—that he has named the Kanorado soil (soil 3 shown in the stratigraphic profile) and the Beaver Creek soil (soil 2). This is the horizon that held the megafauna bones and Paleoamerican artifacts discovered since 1976, and it is ubiquitous throughout the terrace fill. "That's our target," he declares. "It provides a way to systematically search for Paleoamerican as well as pre-Clovis materials." He has already recorded at least two other sites associated with the paleosol and therefore of a known age, where, he says, "We have archaeology and bones, and in one of them was a Clovis point on the floor of the channel right near where this soil is exposed—with a camel bone!"

The series of events that created this setting, so attractive to megamammals and Paleoamerican visitors, has its roots in the deep past, thousands of centuries before the Ice Age. Deep under the valley fill—and extending over the entire High Plains of western Kansas—is the Ogallala Formation, a shroud of fluvial sand and gravel that swept down the eastern slope of the Rockies during the Miocene and Pliocene periods.

Its upper surface, several meters thick, is an impervious caprock of carbonate materials, the "caprock caliche." The Ogallala Formation is a major aquifer throughout the Plains.

Across the Kansas High Plains the Ogallala Formation was capped by Pleistocene gravels, which in turn were capped by Peoria Loess (its age dates from about 24,000 CALYBP at its base to about 11,200 CALYBP at its crown). At Kanorado, the stream cut through Pleistocene gravels and into the Ogallala Formation, in places truncating it completely. "That's what you need to create a seep or spring," Mandel explains. He has seen the Ogallala actually exposed in the channel, and at site 14SN106 there was evi-



dence of seeps or springs coming out of the Ogallala. Moreover, there is ample evidence that springs were once much more prolific than they are today. On the uplands near site 14SN101 a big ridge of Ogallala lies exposed. Landowners queried about it recall that their father had told them that at one time a spring issued from the outcrop; in fact, a farmer once dammed it and made a small pond.

Kanorado exists because the Ogallala Formation lies close to the surface. Mandel traces the chain of cause-and-effect backwards: "What attracted people to this place? Game. What attracted the game? Water. Where was the water coming from? We now know, from right here, where the Ogallala had been truncated." The reason we don't see springs today is because a century of irrigation has lowered the level of the aquifer by hundreds of feet. "But 11,000 radiocarbon years ago," Mandel assures us, "the water table was probably quite high."

Valuable clues in the artifacts

All three sites at Kanorado were temporary campsites for Paleoamerican nomads. They took game, filled their bellies, and repaired and replaced clothing and the tools of their trade before moving on. And they were certainly movers. The artifacts they left behind tell a lot about their mobility patterns to Holen, whose dissertation at the University of Kansas explored long-distance transport of lithic materials in the Clovis period. This is a subject he knows something about.

The first stone tools were found at site 14SN101 in 2002, where Holen and a volunteer from the Museum surveyed both sides of the channelized creek bed. Eroded out of place just below a buried paleosol they found the flint endscraper mentioned above, which Holen recognized from its shape as Paleoamerican in origin. The remarkable feature is the material it's made from, Alibates flint (technically, Alibates agatized dolomite), which outcrops in the Texas Panhandle on the Canadian River near Amarillo—a straight-line distance of 300 miles from Kanorado. Near the base of the paleosol they found flakes of quartzite, which outcrops in southwestern Kansas—not from so far away as Alibates, but transported a fair distance nonetheless.

To date the team mem-

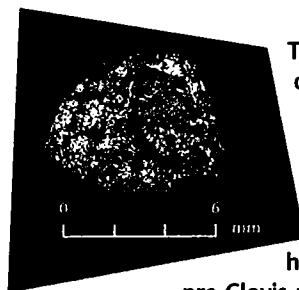


Excavating the lower mammoth–camel bone horizon at site 14SN105, 2005 season.

bers have found at the Kanorado locality, besides Alibates flint, articles made of Flattop chalcedony from northeast Colorado, and of Hartville chert from near Guernsey, Wyoming (like Alibates, about 300 miles from Kanorado). They haven't yet determined conclusively whether the

Alibates flint artifacts derive from the Clovis or the Folsom component.

Holen describes the Paleoamericans who visited Kanorado as very highly mobile people who routinely traveled hundreds of miles across the landscape. Above all, they wanted to use the best-quality lithic material they could get their hands on. This

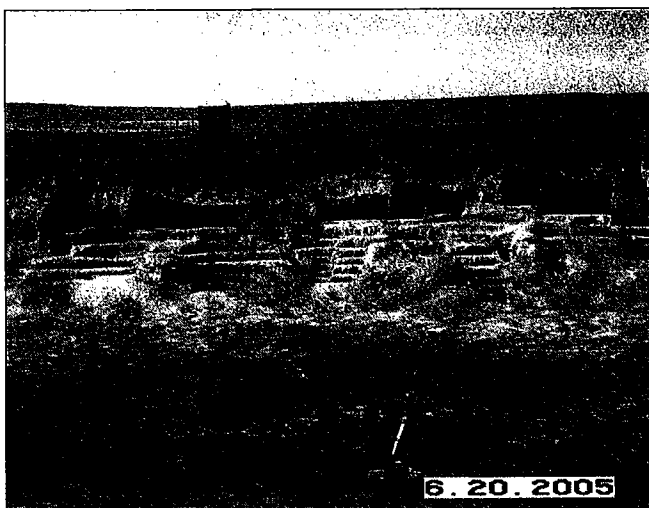


This button-size piece, the dorsal surface of a quartzite flake, is perplexing Holen. It was found in the 2004 season in the lower mammoth–camel bone horizon of 14SN105, which dates to 12,200–12,300 RCYBP. The piece bears two flake scars. What he has to determine is whether the flakes were struck off by natural forces or by a human hand—in other words, is it a geofact or a pre-Clovis artifact?

meant they had to carry toolstone with them because in many parts of the Great Plains, sources of good lithic material are scarce. "Right in the Kanorado area," Holen points out, "there are a few cobbles you can make small artifacts out of, but a lot of it is really fractured, and you have to work long and hard to get good pieces out of it." Consequently flintknappers would visit a good bedrock quarry and make large bifaces, from which they would make tools they needed as they moved across the country.

"Primarily these people moved lithic material within the area they utilized each year," says Holen. However, projectile points found at other sites 500–600 miles from their lithic source are evidence that flintknappers probably also exchanged material. Holen has great respect for the scale of mobility

The completed excavation at 14SN101 at the end of the 2005 season. In the terminal Pleistocene tall cool-weather grasses blanketed the terrain—mammoths, with their enormous appetites, couldn't have subsisted on today's scruffy ground cover.



Lower mammoth–camel bone horizon at
14SN105, 2003 season.

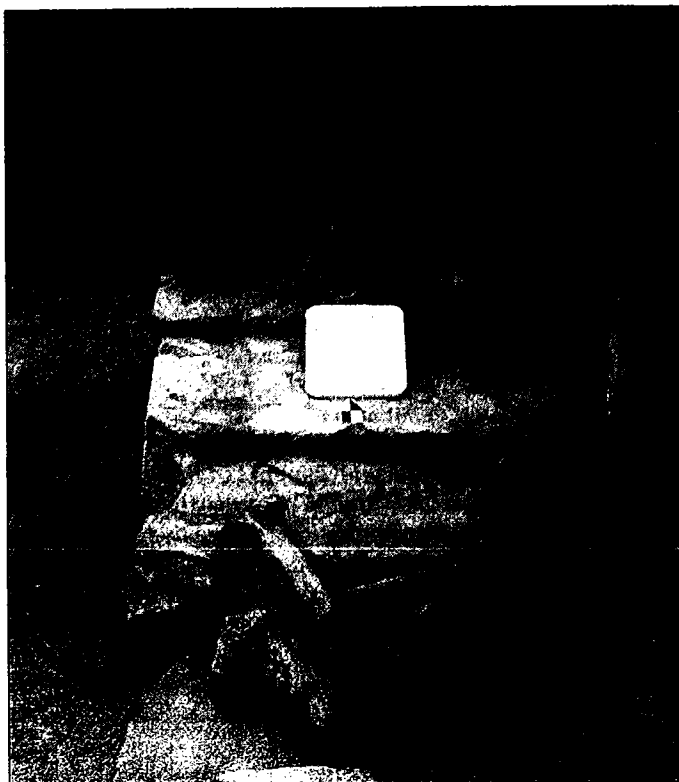
Paleoamericans practiced. Based on his research, he estimates that Clovis people traveled 300–400 miles—this possibly on a seasonal basis, retracing the same route every year. “There was an incredible lithic industry in the Clovis period,” he emphasizes. As for Folsom people, they didn’t move lithic material quite so far, “but still very long distances.”

A project with funding—and plenty of volunteers

Holen and Mandel aren’t the only people excited about finding the first Clovis-age cultural deposits in the Kansas/Nebraska region. In field work this summer at the Kanorado locality, when they were on site a little over two weeks, over 100 volunteers participated at different times. At any time there were usually 30–35 people working at all three sites. Also on hand were graduate students from the University of Kansas and archaeologists from the Kansas State Historical Society, whose head, Public Archaeologist Virginia Wulfkuhle, organized the volunteer operation. Holen notes with obvious gratitude and pride, “This was a real multi-agency effort this year, and it was very successful.”

All the work over the past three years wouldn’t have been possible without funding provided by the Odyssey Archaeological Research Fund, one of five archaeological research programs endowed by Joe and Ruth Cramer of Denver (MT 18-1, “A Campaign to Find the First Americans”). The dig at the Kanorado locality, which holds out the tantalizing possibility of finding evidence of pre-Clovis people, is precisely the kind of project Cramer had in mind when he established the Odyssey Fund at the University of Kansas. Rolfe Mandel was named its director. Cramer, retired after a highly successful career as a geologist in the petroleum industry, has always had a passion for Paleoindian archaeology, and he has long nursed a deep-set conviction that the first Americans walked this land well in advance of the Clovis culture, perhaps as early as 25,000 years ago. Discovering where to look for the evidence is the task facing Mandel and the directors of the other Archaeological Research Funds. For Steve Holen, the partnership with Mandel gives him the opportunity to practice science. For three years, the Odyssey Fund has underwritten the bulk of the costs to explore the Kanorado sites; the Denver Museum of Nature & Science has contributed some money (and pays Holen’s salary during the time he spends on site).

In situ endscraper, probably
Folsom, in buried A horizon
soil at 14SN106, 2005 season.



We shouldn’t be surprised to hear that Joe Cramer, well into his eighties, has visited the Kanorado locality, doubtless to look over the scientists’ shoulders figuratively. And probably literally, too. 🐘

—JMC

Suggested Readings

Mandel, R. D., J. L. Hofman, S. Holen, and J. M. Blackmar 2004 Buried Paleo-Indian Landscapes and Sites on the High Plains of Northwestern Kansas. In *Field Trips in the Southern Rocky Mountains, USA: Geological Society of America Field Guide 5*, edited by E. P. Nelson, pp. 69–88. The Geological Society of America, Boulder, Colorado.

Mandel, R. D., S. Holen, and J. L. Hofman in preparation Geoarchaeology of Clovis and Possible Pre-Clovis Cultural Deposits at the Kanorado Locality, Northwestern Kansas. *Current Research in the Pleistocene* 22.

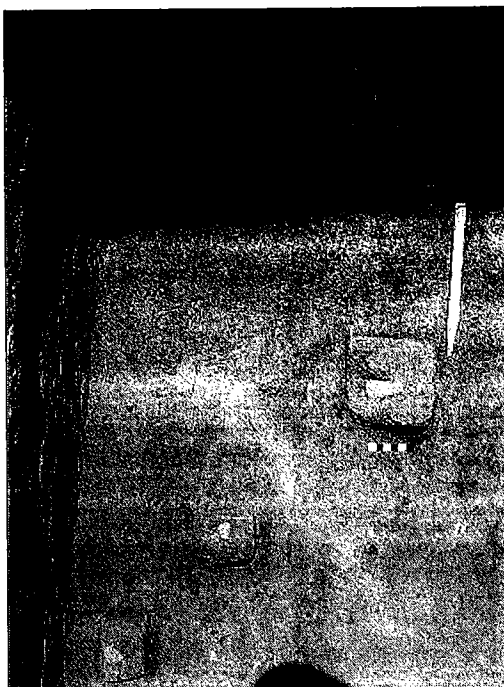
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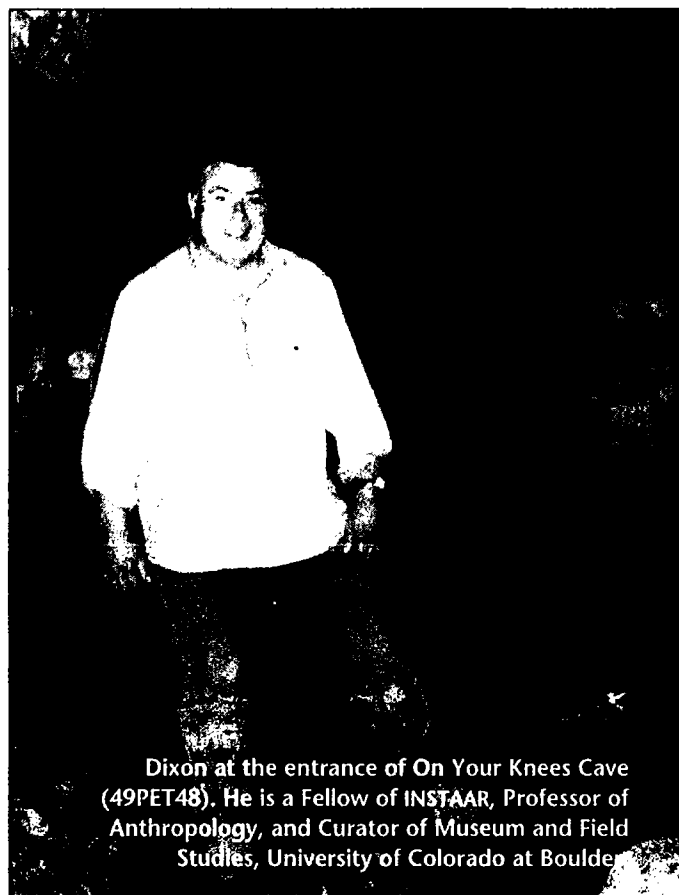
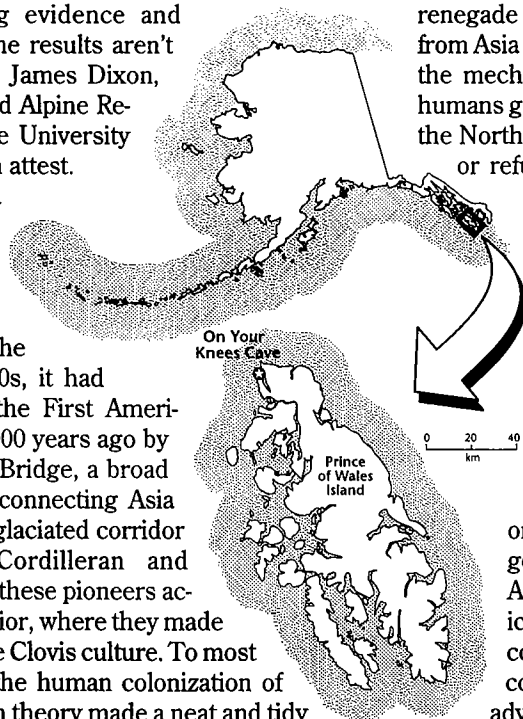


Exploring the Northwest Coast

E. James Dixon and the Peopling of the New World

BY ITS VERY NATURE, archaeology is largely theoretical. Until we invent a working time machine, some questions—such as whether *Homo erectus* really used fire, or what triggered the rise of modern humans in Neanderthal Europe—will remain open to interpretation. We can build logical hypotheses from existing evidence and ideas, but logical or not, the results aren't necessarily popular—as E. James Dixon, of the Institute of Arctic and Alpine Research (INSTAAR) and the University of Colorado at Boulder, can attest.

Archaeologists love a good discussion, and no discussion is finer than the one surrounding the mystery of just how and when people first came to the Americas. By the mid-1980s, it had become near-gospel that the First Americans had arrived some 12,000 years ago by means of the Bering Land Bridge, a broad corridor of dry land then connecting Asia and North America. An unglaciated corridor between the massive Cordilleran and Laurentide ice sheets gave these pioneers access to the continental interior, where they made their presence known as the Clovis culture. To most researchers interested in the human colonization of the Americas, the Beringian theory made a neat and tidy kind of sense. It was an elegant explanation for a complex issue. But was it really that simple?



Dixon at the entrance of On Your Knees Cave (49PET48). He is a Fellow of INSTAAR, Professor of Anthropology, and Curator of Museum and Field Studies, University of Colorado at Boulder.

E. JAMES DIXON

Enter the coastal option

Not everyone bought into the Beringian theory. Some of these renegade researchers did agree that the first Americans came from Asia at the end of the last Ice Age, but they disagreed about the mechanism by which they arrived. They suggested that humans got here by another route, by paddling watercraft along the Northwest Coast and searching out ice-free green pockets, or refugia, where it was possible to survive. By the early 1990s, Dr. Dixon, then at the University of Alaska Fairbanks, had emerged as perhaps the best-known proponent of the so-called coastal route theory.

The coastal migration concept was first seriously considered in the 1960s, but the paleoenvironmental and archaeological outlines weren't fleshed out until Canadian archaeologist Knut Fladmark undertook the task in the mid-1970s. There was little support, however, for Fladmark's work. While many researchers accepted the possibility of a coastal immigration, it usually came in a distant second to the Beringian theory in papers, classes, and general discussions of the peopling of the New World. After all, entering North America via Beringia and an ice-free corridor would have required nothing more complex than muscle and good footwear. Exploring the coast in watercraft would have required a relatively advanced level of maritime technology and marine subsistence practices, which many researchers seemed unwilling to credit to the earliest Americans.

However, as researchers have continued to fill in the geological and paleontological history of the relevant portions of North America, it has become clear that there are flaws in the Beringian theory—serious flaws, possibly enough to scuttle the theory altogether.

A viable theory

James Dixon started to come around to the coastal route theory in the late 1980s. "I think the geological research in central Canada regarding the Ice-free Corridor became more convincing," he says. "It didn't part until about 11,000–12,000 years ago, depending on which dates you like, so it would have been difficult to enter the more southern parts of the continent before then. The earliest dates for Clovis predate the establishment of a biotically viable deglaciation corridor. Furthermore, an increasing number of reliably dated pre-Clovis sites dating between 12,000 and 15,000 years ago have been reported in the past several decades. This led some of us to believe that there may be an alternative route."

If the Ice-free Corridor integral to the Beringian theory didn't exist until 11,000 years ago, and if humans were south of the continental glaciers at least a thousand years before, something's definitely wrong with the theory. This doesn't even take into account the so-called pre-Clovis sites scattered across the Americas, from the problematic ones like Meadowcroft in Pennsylvania to better-sup-

Microblades recovered from On Your Knees Cave. ►

Bifaces and biface fragments recovered from On Your Knees Cave. ▼

ported sites like the 14,000-year-old Monte Verde site in Chile. Pre-Clovis sites have also been found in Alaska (MT 20-1, "Early Americans in Eastern Beringia: Pre-Clovis Traces at Swan Point, Alaska"), behind the wall of ice separating Beringia from North America, and may have been home to at least some of the people who Dixon believes may have explored the Northwest Coast refugia.

Dixon is the first to admit that the scenarios he and his coastal-route colleagues postulate are hypothetical, but notes that by about 16,000 years ago the refugia were open and available and the Northwest Coast was largely ice free. Some Asian groups may have had the necessary technology, in the form of animal-skin boats, to follow the coast for long distances, and he believes it's possible they were investigating the Northwest Coast as early as 14,000–16,000 RCYBP. "I'm basing this on the geology and

paleobiology of the period," he states. "It was certainly a viable habitat about 15,000 to 16,000 years ago."

Dixon has gathered copious and convincing data on the geological, paleontological, and archaeological history of the Northwest Coast, not least of which are progressively convincing data regarding the Ice-free Corridor (or lack thereof). As a result, he still believes that the coastal theory is the explanation that makes the most sense, given the data we have at the present time—and he and others have found startling evidence to back up their claims.

The evidence piles up

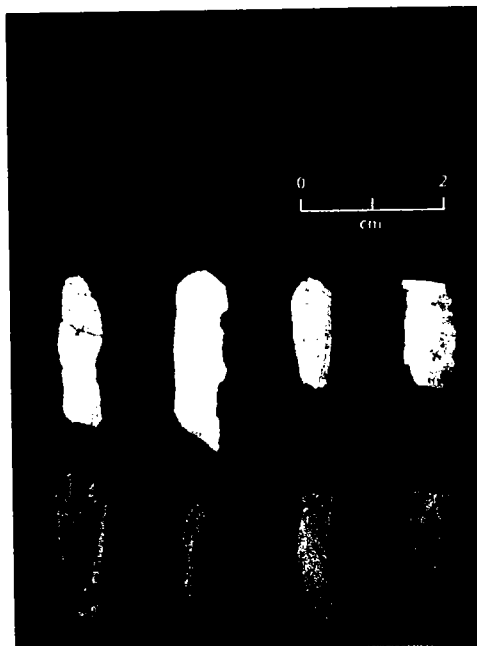
In recent years, Dixon has focused much of his attention on the Alexander Archipelago, a densely forested island group off the coast of Alaska. Here, as on the rest

of the Northwest Coast, the archaeological evidence for the coastal theory has been mostly overwhelmed by the sea. As the great ice sheets melted at the beginning of the Holocene era, seas levels rose hundreds of feet.

The evidence is still there, though it's sometimes hard to get to. In 1996, Timothy Heaton, a paleontologist from the University of South Dakota, made an exciting discovery while investigating a cave on Prince of Wales Island, a member of the Alexander archipelago. On Your Knees Cave, a cramped cavern formed as eons of groundwater percolated through limestone, contains abundant ancient faunal material. Heaton found well-preserved faunal remains from as early as 41,000 years ago—not to mention scattered human remains dating from 9,200 RCYBP. Clearly, the concept of ice-free refugia along the Northwest Coast is on solid footing.

The scraps of human bone recovered from On Your Knees Cave turned out to be the oldest such remains known for the Northwest Coast. They all come from a single individual, a young man in his early twenties. His bones, whose chemical profile suggests a primarily marine diet, were widely scattered, and include a few vertebrae, a pelvis, and a mandible. No long bones have been identified so far. Dixon speculates that either the individual was killed by a bear (the remains of both black and brown bear were found in the cave), or scavengers brought his remains to the cave. Other animal bones found in the cave include those of ringed seal, caribou, fish, birds, and arctic fox. They may or may not be associated with human occupation of the cave.

The skeletal remains aren't the only evidence of an early



RICK WICKER, DENVER MUSEUM OF NATURAL HISTORY; COURTESY OF INSTAAR

ERIC PARRISH; COURTESY OF INSTAAR

human presence on Prince of Wales Island. In fact, according to Dixon, the cave was occupied more than once around that time. Subsequent excavations have produced evidence of a slightly younger occupation, but it's hard to say if it is related to the skeletal remains in any way. The assemblage is characterized by microblades—tiny flakes used in the composite tools that were the hallmark of the earliest local cultures—and both leaf-shaped and stemmed bifaces. More intriguing is material that appears to date from somewhat before the unfortunate young man's demise: one bone tool, for example, has been dated to 10,300 RCYBP (uncalibrated). In addition, a few artifacts have been recovered from below the microblade level outside the cave. This very ephemeral occupation may predate both the human remains and the bone tool.

The presence of humans so early at On Your Knees Cave is robust evidence that people were using the Northwest Coast during the Paleoindian period, well before the ice sheets melted completely. Research by Canadian archaeologist Daryl Fedje dramatically underscores this point. Not only have Fedje and his colleagues discovered a veritable forest of tree stumps on the ocean floor off nearby Queen Charlotte Islands, they've also recovered plenty of other arboreal evidence, ranging from pine

orbit, and other astronomical ephemera that, though relatively minor, over time add up to huge climatic changes.

In recent years, glaciers and ice sheets have started melting again all over the world. This time the culprit is us. Humans have pumped so much carbon dioxide and other greenhouse gases into the atmosphere that it has become a very efficient heat sink, resulting in the incremental temperature increases popularly known as global warming. They're minor on average, but enough to set the millennial ice to melting, even in places previously considered forever glacial.

There are a myriad of reasons why this is important. Most significant is the possibility that we're on the threshold of an unprecedented ecological disaster. From an archaeological perspective, global warming is important because a few of the melting ice patches contain artifacts. In recent years, James Dixon has been involved in rescuing those artifacts before they're forever lost. "I've always been interested in cultural ecology, and the ice-field work fits in well with that," says Dixon. He's also interested because of the intriguing possibility that some very old material could be recovered from these frozen sites, where they've been preserved for thousands of years.

Organic materials are especially valuable because they can be directly dated, and so far the results have been encouraging. Wooden arrow shafts, antler projectile points, and composite wood-and-stone tools have been recovered from various glacial sites in Alaska and elsewhere. Their ages vary from just a few hundred years old to a few thousand. Canadian archaeologist Greg Hare and his colleagues have recovered a bone atlatl dart, apparently slotted to receive microblades, that dates to 7800 RCYBP—not long after the end of the Paleoindian era (**MT 19-2**, "Nature's Freezer Yields Look at Ancient Hunting Grounds"). Dixon remains optimistic about the possibility of recovering

Dixon (*center*) and colleague Craig Lee during an archaeological survey of a glacier in Wrangell St. Elias National Park, Alaska, July 2001.



ROBERT IVAN, COURTESY OF INSTAAR.

cones to pollen. Moreover, in May 1998 his team retrieved a worked basalt blade from a spot 50–55 m (about 164–180½ ft) below the surface of Werner Bay, near the Queen Charlotte Islands—a one-in-a-million find for a team using grab samplers to probe the ocean floor 200 ft below. The stone tool, 4 inches long, is estimated to be at least 10,200 years old.

So not only had these drowned lands once supported a boreal forest, humans were on the scene very early on, at least by the time the Clovis and Folsom peoples appeared in the American Southwest. There's always the possibility, Fedje admits, that the flake was dropped out of a boat well after the bay was inundated. However, there's no doubt that people could have lived in that landscape more than 10,000 years ago.

Artifacts on ice

Ten thousand years ago, the world warmed up a bit and the ice sheets expanding from the poles toward the mid-latitudes began to melt. After several centuries of study, scientists are still arguing about why this occurred, but it appears to be part of a natural cycle involving the Earth's axial tilt, the precession of its

even earlier materials. "I hope we might find some Paleoindian-age materials, so that we can get a glimpse into the organic component of those cultures," he says.

Any organic artifacts that old would be significant finds, but it'll take the dedication of many archaeologists like Dixon to find them, and time is running out. Global warming is nibbling away at the ice fields of the world, exposing new artifacts daily. Once they're out among the elements, these precious objects have to be recovered before they decompose—and if that happens, they may as well never have existed. 📻

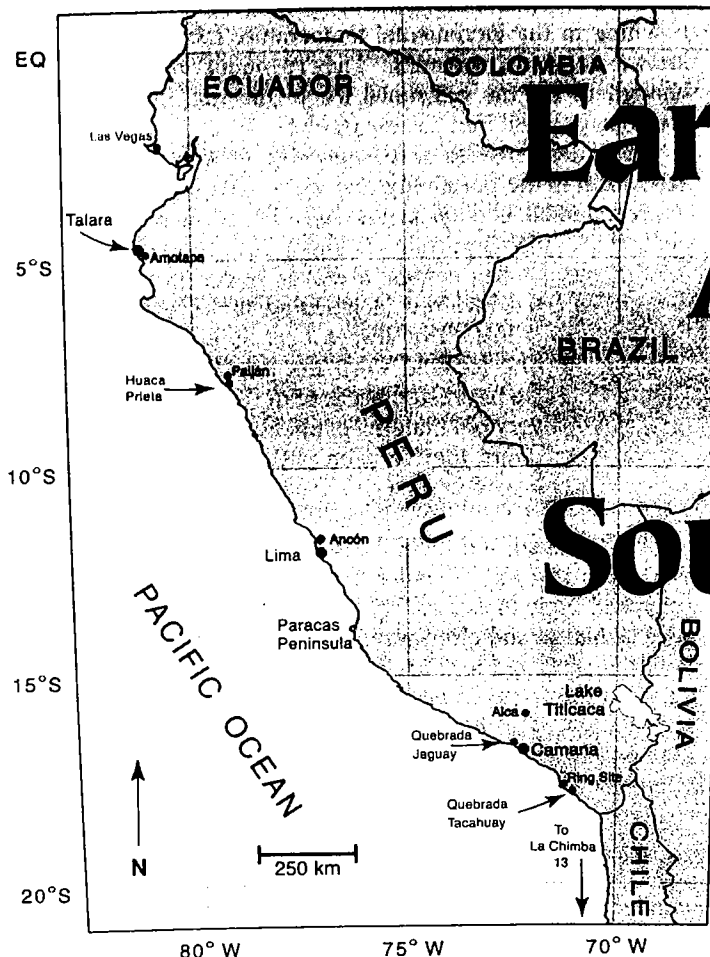
—Floyd B. Largent, Jr.

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FISHING HAS DISTINCT biological, technological, and social correlates, so archaeologists working in coastal zones must be concerned with tracking and analyzing maritime adaptations through time. Nowhere is this more true than the coast of Peru and adjacent countries in western South

change in our understanding of the timing and importance of maritime adaptations in the region. We now know that even the earliest coast dwellers depended on fishing and littoral collecting, and that ocean-oriented lifeways have characterized the region ever since.



- Archaeological Site
- Modern city

America, one of the most productive marine ecosystems in the world. In this article, I briefly review the history of study and synthesize the current state of knowledge concerning early maritime adaptations in this region, and point to some implications of these new data. I limit my discussion to the central Andes—southern Ecuador, Peru, and northern Chile, as this is the region where the majority of early coastal sites have been excavated.

Through the 1960s, archaeologists working in western South America generally believed that extensive and intensive use of marine resources began late in the middle Holocene (after about 5800 CALYBP). The last 40 years have seen a sea

Engel's Pit A in 1992 at Quebrada Jaguay, an early-to middle-Preceramic fishing site in southern Peru near Camaná. The site is named for the gully (*jaguay* means canyon) in the background.

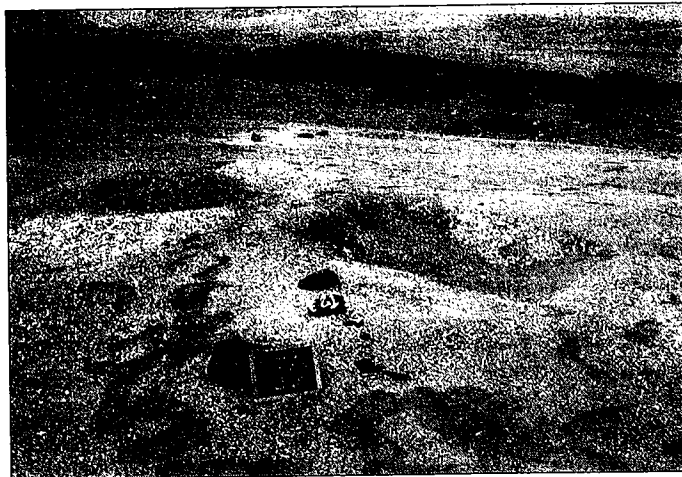
Early Maritime Adaptations in Western South America

Part 1 of a two-part story

by Daniel H. Sandweiss

The archaeology of maritime adaptations in Peru and northern Chile: A historical review

Preceramic sites on the coast of South America were first reported in the 1920s. However, it was not until the 1930s and '40s that American Museum of Natural History archaeologist Junius Bird really put the coastal Preceramic on the map, with excavations in northern Chile and then in northern Peru at the late-Preceramic Peruvian site of Huaca Prieta. Although in both areas Bird found evidence for intensive fishing, most attention



focused on his characterization of Huaca Prieta's inhabitants as America's first farmers.

During the 1950s, French archaeologist Frédéric Engel began research on Preceramic coastal archaeology in Peru. He, too, found evidence of marine resource utilization but chose to focus on other issues, in particular the use of the *lomas* (fog

coastal plain. The ocean only reached its modern position at about 6000 CALYBP—the same time that Lanning first found evidence for marine resource use.

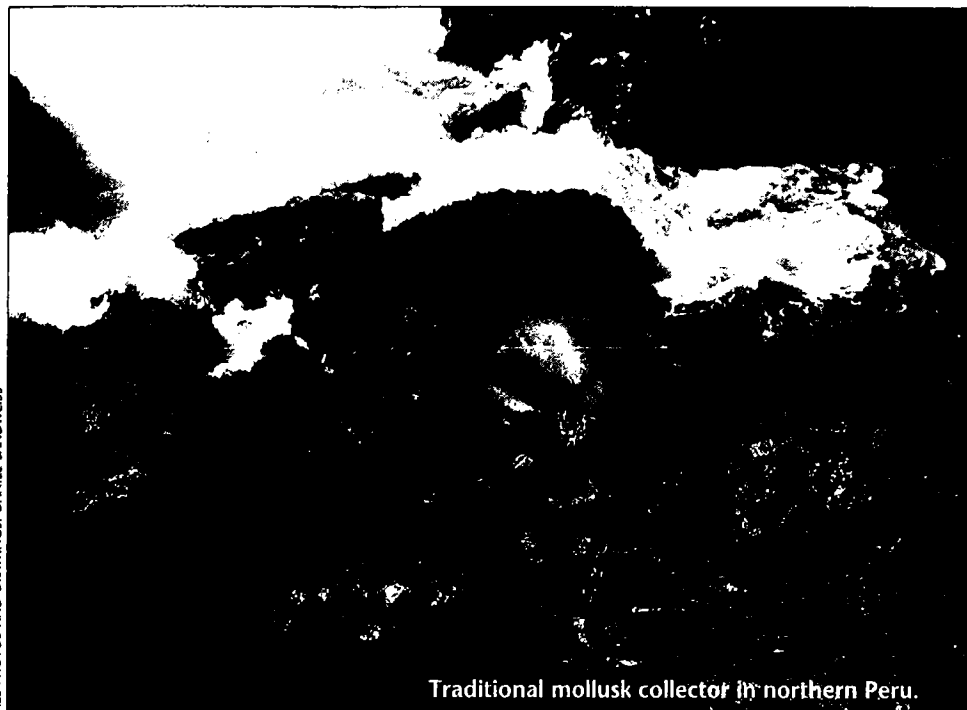
Sites stand out on the desert coast of Peru and northern Chile. If Lanning hadn't found early maritime sites, then it was easy to think that none existed. Other archaeologists naturally followed Lanning's lead. Working in the same region in the late 1960s, Michael Moseley excavated a number of late-Preceramic sites near Ancón. Confirming Lanning's observation that animal remains were predominately maritime, he placed these data in the broader context of the Central Coast late-Preceramic archaeological record. Noting that the first large coastal temples dated to this time and region, Moseley proposed the controversial Maritime Foundations of Andean Civilization hypothesis, that seafood—not just agricultural products—underwrote the first formation of Andean civilization.

While Moseley was digging on the central coast, Richardson was working on the far northern coast of Peru, near the oil port of Talara, where the continental shelf is extraordinarily narrow. In the late 1960s and early 1970s, he found middle- and even

early-Preceramic sites that contained abundant evidence of marine resource use, especially shells of edible mollusks. One of these shells, from the Amotape campsites, produced a radiocarbon date of about 12,200 CALYBP. During the late-Preceramic period and more recent epochs, the Talara region was a relative backwater compared with the central coast of Peru; in the 1970s there was no reason to believe that this wasn't true in the early-Preceramic Period. Why, then, would the earliest Talareños take advantage of seafood while the innovative inhabitants of the Central Coast ignored this easy and abundant source of nutrition? It made no sense.

meadow) resource zone. Engel was the first to acquire radiocarbon dates from multiple coastal sites.

Research into Preceramic maritime adaptations began in earnest in the 1960s. On the central coast of Peru, at Ancón, Edward Lanning studied a series of Preceramic sites and produced the first detailed sequence for the coastal Preceramic epoch. Maritime adaptations played a role in his reconstruction of events: he found no significant use of marine resources before 5800 CALYBP, and an increasing importance of seafood thereafter. In his landmark 1967 text *Peru before the Incas*, Lanning used this sequence as a model for all of coastal Peru. Unfortunately, as James Richardson pointed out 14 years later, Lanning failed to take into account the possible effects of post-glacial eustatic sea level rise on the preservation of archaeological sites. This phenomenon had been recognized long before the 1960s, and by that time the approximate chronology and magnitude were understood. Because the continental shelf is relatively wide and shallow at Ancón, the shoreline there lay many kilometers to the west when people first arrived in the region about 13,000 CALYBP. Consequently, most early maritime sites probably lay to the west of the modern shoreline, on the now-drowned



Traditional mollusk collector in northern Peru.

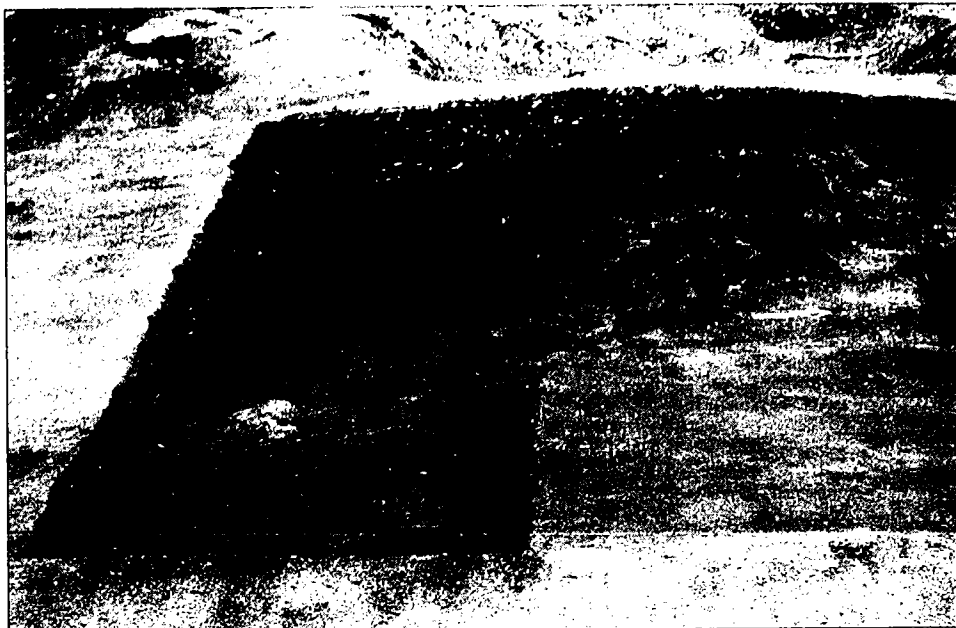
ALL PHOTOS AND DRAWINGS: DANIEL SANDWEISS



In 1981, Richardson published his answer to this question: central coast-dwellers of the early- and middle-Preceramic Periods probably *were* using marine resources, but the sites containing evidence for this practice lay on distant

Huaca Prieta, a late-Preceramic fishing and farming village in northern Peru, excavated in the 1940s by Junius Bird.

Middle-Preceramic, semi-subterranean, circular house with central hearth in Sector I, Quebrada Jaguay. Note the clay molds of rocks used to support the original superstructure and the shells used to fill the house after abandonment. The excavation shows about a quarter of the original house, which was about 5 m in diameter.



shorelines now drowned by rising sea level. Where the continental shelf is narrow, as at Talara, the 60 m of sea level rise between 13,000 and 6000 CALYBP (early- and middle-Preceramic Periods) caused relatively little horizontal displacement of the shoreline, while in areas of wider shelf, the shoreline would have moved significant distances over this period and inundated many more sites.

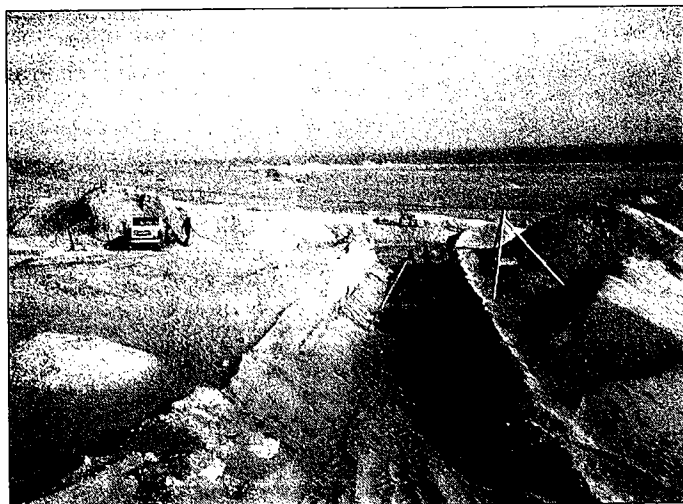
As a test of this hypothesis, Richardson suggested that early maritime sites should be located on those parts of the coast—like Talara—where the shelf is narrow and the shoreline moved only a short horizontal distance as sea level rose. Appropriate areas included the far northern Peruvian coast near Talara and the Peruvian coast from the Paracas Peninsula south through northern Chile. In the 1970s, Chilean archaeologist Agustín Llagostera had excavated a shell midden site at La Chimba 13 (formerly called Quebrada de las Conchas) in northern Chile. His two original dates were almost 11,000 years old. This site now fit into the emerging picture.

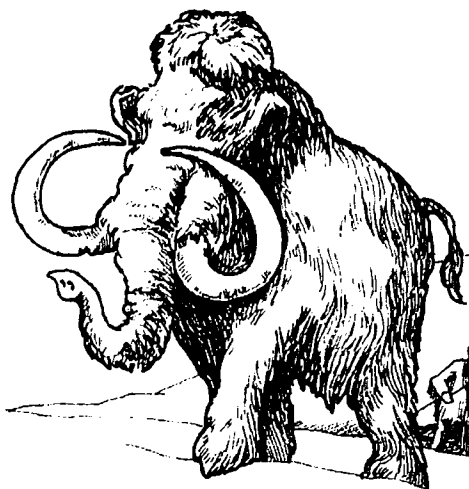
In 1983, Jim Richardson and I began excavations in southern Peru, not far north of the Chilean border, at the large shell midden known as the Ring Site. There we found a subsistence system in which all kinds of marine animals were exploited—fish, shellfish, sea urchins, sea mammals, and sea birds. There were almost no bones of land animals. The Ring Site people probably used plant foods, but no evidence survived. A

Excavations in 1985 at the Ring Site, an early- to middle-Preceramic fishing site near Ilo in southern Peru.

Detail of Unit C. ►

Bulldozer trench made by the local smelting operation to extract shells; Unit C is on the right side of the trench near the standing individuals. ▼





CLOVIS

in the Southeast

Technology • Time • Space

October 26–29, 2005

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PROJECTILE POINT distribution studies over the last decade have borne out what many archaeologists have observed—more fluted points are found in the East than in the West. Furthermore, the Southeast has far more fluted points than the rest of the country. Ironically, although the Southeast may have the greatest number of fluted points including Clovis, there has never been a conference convened specifically to investigate Clovis culture there and the implications for its origins—until now.

The Clovis in the Southeast conference will scientifically explore the Clovis Culture and its origins within the southeastern United States, addressing such issues as Clovis origins, dating, geoarchaeological issues, and Clovis technology and site variation across the regions. We encourage the public to attend and learn from the presentations. Since most of the stone tools made by Clovis and other Paleoindian cultures have been found by and are in the possession of private collectors, the public will also play a major role by displaying Paleoindian artifact collections of scientific importance. This conference will showcase these important artifacts to scientists and give them the opportunity to educate collectors and other interested members of the public.

The Columbia Metropolitan Convention Center, which can accommodate up to 1,000 people, will host programs, exhibits, and traditional scientific presentations for three days and nights. The conference will conclude with a bus trip to South Carolina's Big Pine Tree and Topper sites. Both sites have Clovis occupations, and Topper also boasts a substantial pre-Clovis occupation.

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Also on display: Florida Paleos ■ North Carolina fluted points ■ McCary Fluted Point Survey, Virginia ■ Capps Lithic Technology, Alabama.

Conference Web site with details on conference agenda ■ symposium focus ■ speakers ■ displays and exhibitions ■ hotel information ■ on-line registering

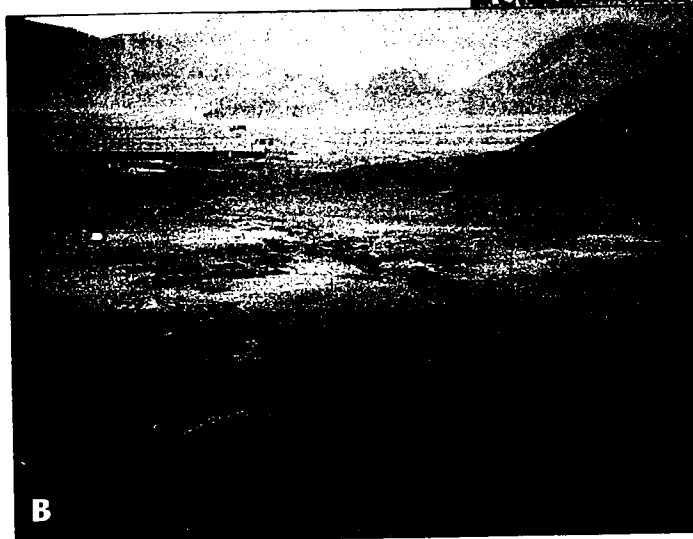
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Middle-Preceramic coastal sites in Peru.

A, detail of warm-water shells and fish from the Ostra Base Camp, north of the Santa River in northern Peru.

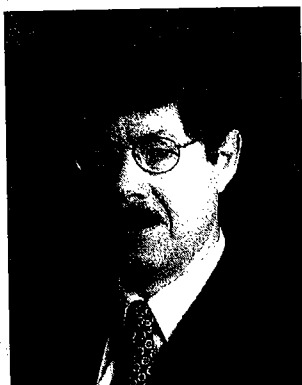
B, La Paloma, near the Chilca Valley just south of Lima.

C, view from the Ostra Collecting Station across the fossil Ostra Embayment, north of the Santa River in northern Peru.



About the author Dan Sandweiss is an archaeologist interested in climate change and maritime adaptations in Latin America. Most of his research has been carried out on the desert coast of Peru, beginning in 1978, but he has also worked in Central America and Cuba.

Dr. Sandweiss has excavated the earliest known fishing site in the New World as well as fishing sites of other epochs including the Inca Empire. He directed excavations for three years at Túcume, Peru's largest pyramid center, as part of a project coordinated by Norwegian explorer and scientist Thor Heyerdahl. Sandweiss also has a particular interest in the prehistory of El Niño, a global climatic perturbation first recognized in Peru and



now known to affect weather throughout the world, and he has developed a variety of techniques for identifying ancient El Niño activity. Sandweiss was President of the Scientific Committee for FERCO (Foundation for Research and Exploration on Cultural Origins), a Canary Island foundation, from 1998 to 2002; he is the founder and editor of *Andean Past* (Cornell University Latin American Studies Program); and he is Chair-Designate of the Society for American Archaeology's Committee on the Americas. Sandweiss has published frequently in *Science* as well as in other journals, and he is the author and editor of several books and monographs. Sandweiss received a B.A. in Archaeology from Yale University in 1979 and a Ph.D. in Anthropology from Cornell University in 1989.

This article is a revised and updated version of the article by Sandweiss, David K. Keefer, and James B. Richardson III that appeared in 1999 in the inaugural issue of *Discovering Archaeology*. The current version was presented at the 2005 annual meeting of the Society for American Archaeology.

Projectile Point Technology and Economy: A Case Study from Paiján, North Coastal Peru

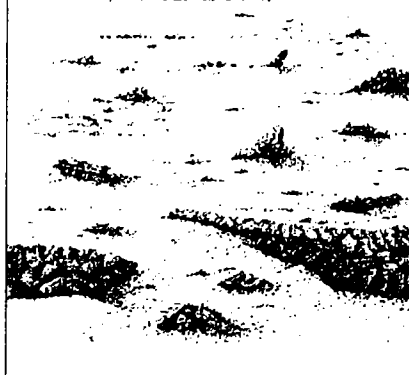
Claude Chauchat and Jacques Pelegrin,
principal authors

THE PAIJÁN CULTURE, whose lithic industry manufactured exotic projectile points, is a poorly understood Paleoamerican tradition. Contemporaneous with the famous Folsom culture in North America, it is known from open-air sites and one rockshelter spread over 1000 km of the Peruvian coastal desert.

Claude Chauchat and his research team present a detailed archaeological case study of the Cupisnique region at the Pampa de los Fósiles locality on the north coast of Peru. This volume uses the *chaîne opératoire* approach, originally developed in France for studying flaked-stone tool assemblages. Stone tool assemblages are characterized as a succession of technical actions beginning at the moment of raw material acquisition and continuing through manufacture, utilization, and final abandonment of tools. The *chaîne opératoire* approach,

Projectile Point Technology and Economy A Case Study from Paiján, North Coastal Peru

Claude Chauchat • Jacques Pelegrin • Oscar Salazar Alonso
Remedio Becerra Salazar • Sandra Siquiera Díaz
With an Appendix by César Salazar Alonso • Hilary Martin • Philippe Ponsard
Foreword by Jacques Pelegrin
Translated from French by Margaret O'Hare
Center for the Study of the First Americans • Texas A&M University



applied to the study of a surface lithic workshop area at the site of Pampa de los Fósiles 14, Unit 1, documents raw material use at flaking loci and describes cores, flakes, flake tools, limaces, bifaces, and lithic reduction practices of the Paiján site occupants. The structure and employment of flaking areas are presented in plan maps, and stages of bifacial production are inferred from archaeological remains. Refitting studies and lithic technology experiments based on site patterning provide insights into tool production decisions and spatial patterning of workshop activities. Steps used in creating a Paiján point are illustrated through lithic replication experiments. In addition to providing a detailed

history of stone tool flaking activities, the investigators combine raw material acquisition patterns with regional survey data to infer mobility models for the Paiján people. This amply illustrated volume will excite prehistoric archaeologists, lithic technologists, and knowledgeable readers.

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shell from the bottom of the Ring Site yielded a date of 11,400 CALYBP, but all the other dated materials, both shell and charcoal, had ages between about 9100 and 5800 CALYBP.

Meanwhile, in southern Ecuador, a few hundred kilometers

about 13,000 and 11,400 CALYBP, but the scanty remains didn't show what sort of food these people ate. At the same time, French archaeologist Claude Chauchat's work at sites of the Paiján culture of northern Peru showed people with an inland adaptation who were in contact with the shoreline as far back as 12,250 calendar years ago. The Paiján sites are on the inland side of the modern coastal plain, and the shoreline 12,000 calendar years ago was many kilometers further west. The Paiján people must have had stations near the ocean to exploit marine resources, but because of rising sea level the only evidence we have is a few fish bones and shells carried to their interior camps. We cannot know whether there were separate coastal and interior groups who traded products or whether Paiján groups moved back and forth between beach front and foothills.

By the end of the 1980s, numerous middle-Preceramic maritime sites dating between

Sandweiss in *lomas* (fog-based)
vegetation in southern Peru during the
1982–1983 El Niño event.



north of Talara, excavations by North American archaeologist Karen Stothert at the Las Vegas site had shown a mixed economy that included marine resources. Dates ranged from 11,400 to 7500 CALYBP; a pre-Vegas occupation dated between

about 9000 and 5000 years ago had been excavated along the Peruvian and Chilean coasts. No longer was there any doubt that South American maritime adaptations were far earlier than Lanning and others had believed in the 1960s and 1970s.

Still, all the well-dated maritime occupations came comfortably after the first settlement of South America. They had nothing to say about migration routes and could be classified as a peripheral development by those who saw the transition from terrestrial hunting and gathering to farming as the crucial transformation of Andean civilization. The early dates from Amotape and the Ring Site could be dismissed—shell is a difficult material to date, and neither date was supported by similar results from the same site. Even the dates then available from La Chimba 13 in northern Chile postdated 11,400 CALYBP and therefore are later than the initial settlement of Peru. 🐘

End of part 1

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Suggested Readings

- Chauchat, C., J. Pelegrin, et al. 2004 *Projectile Point Technology and Economy: A Case Study from Paiján, North Coastal Peru*. Center for the Study of the First Americans, Texas A&M University.
- deFrance, S. D., D. K. Keefer, J. B. Richardson III, and A. Umire A. 2001 Late Paleo-Indian Coastal Foragers: Specialized Extractive Behavior at Quebrada Tacahuay, Peru. *Latin American Antiquity* 12:413–26.
- Dillehay, T. D. 1999 The Late Pleistocene Cultures of South America. *Evolutionary Anthropology* 7(6):206–16.
- Keefer, D. K., S. D. deFrance, M. E. Moseley, J. B. Richardson III, D. R. Satterlee, and A. Day-Lewis 1998 Early Maritime Economy and El Niño Events at Quebrada Tacahuay, Peru. *Science* 281:1833–35.
- Llagostera M., A., R. Weisner H., G. Castillo G., M. Cervellino G., and M. A. Costa-Junqueira 2000 El Complejo Huentelauquén bajo una perspectiva macroespacial y multidisciplinaria. *Contribución Arqueológica* 5(1):461–82.
- Moseley, M. E. 1975 *The Maritime Foundations of Andean Civilization*. Cummings, Menlo Park, CA.
- Richardson, J. B. III 1981 Modeling the Development of Early Complex Economies on the Coast of Peru: A Preliminary Statement. *Annals of Carnegie Museum* 50: 139–50.
- Sandweiss, D. H., J. B. Richardson III, E. J. Reitz, J. T. Hsu, and R. A. Feldman 1989 Early Maritime Adaptations in the Andes: Preliminary Studies at the Ring Site, Peru. In "Ecology, Settlement, and History in the Osmore Drainage, Peru," ed. by D. S. Rice, C. Stanish, and P. R. Scar. *BAR International Series* 545 (i): 35–84.
- Sandweiss, D. H., H. McInnis, R. L. Burger, A. Cano, B. Ojeda, R. Paredes, M. Sandweiss, and M. Glascock 1998 Quebrada Jaguay: Early Maritime Adaptations in South America. *Science* 281:1830–32.
- Stothert, K. E. 1992 Early Economies of Coastal Ecuador and the Foundations of Andean Civilization. *Andean Past* 3:43–54.
- Tanner, Benjamin R. 2001 Lithic Analysis of Chipped Stone Artifacts Recovered from Quebrada Jaguay, Peru. Unpublished M.S. thesis in Quaternary Studies, University of Maine. <http://www.library.umaine.edu/theses/theses.asp?Cmd=abstract&ID=QCS2001-001>

Dept. of the Interior Stands Up for Science

continued from page 5

given priority over the rights of scholars and the public to learn about the ancient American past. On the other hand, Barran, Schneider, Seidemann, and many scientists believe the McCain amendment is a misguided attempt to subvert NAGPRA's carefully negotiated balance of interests. It is perplexing that SAA and AAPA appear to agree with those who seek to alter NAGPRA to the detriment of science.

The future of the amendment is undetermined, but it is abundantly clear that it is not the "non-controversial" technical correction to NAGPRA claimed by a Senate staff member when it was first presented (buried in a larger bill). It is appropriate that it be considered as a separate bill so that it can be subjected to thorough scrutiny and debate.

What are the implications for Kennewick Man?

What does this proposed amendment augur for Kennewick Man? According to an article in the *Tri-City Herald*, a McCain aide indicated the Committee had received differing opinions from lawyers as to whether or not the McCain amendment, if passed, could be applied retroactively to Kennewick Man. Cer-

tainly, nothing could stop Native Americans from making a new NAGPRA claim, which, if the amendment were passed, would automatically bypass the "Native American" hurdle that blocked the original attempt by a coalition of tribes to claim the remains. Kennewick Man would thereby become swallowed in another legal quagmire that might take years to resolve and whose outcome would be uncertain. For now, in a surprising reversal of fortune, the DOI is on the side of science. With another change in administration, however, Kennewick Man, or the even older Spirit Cave Woman, might be reburied and much of what they could tell us of their lives and times would be irretrievably lost to the world. 🐘

—Bradley T. Lepper

blepper@ohiohistory.org

The opinions expressed in this article are those of the author and do not necessarily reflect those of the Ohio Historical Society, with whom he is employed as a curator of archaeology.

For more information about the testimony offered at the hearing before the Senate Committee on Indian Affairs, see http://indian.senate.gov/2005hrsgs/072805wit_list.htm. See also the Friends of America's Past Web site <http://www.friendsofpast.org/>. The *Tri-City Herald* Kennewick Man Virtual Interpretive Center is another good source of information on the controversy.

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