MAMMOTH TRUMPET

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Center for the Study of the First Americans
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If Cows Do It . . .

A cow in Marin County, Calif., rubs against a boulder—exactly as you'd expect a Pleistocene bison to do it. Breck Parkman, an archaeologist with the California State Parks, believes he may have found a favorite rubbing place for Pleistocene megamammals on the shore at Sonoma Coast State Beach, not far from where this cow is easing her discomforts. At the site he calls Mammoth Rocks there is abundant evidence of rubbing, at places 13 ft above the ground. If he's right, the rocks may have recorded the species of Rancholabrean visitors in ancient DNA embedded in the surface. His story begins on page 4.

E. BRECK PARKMAN

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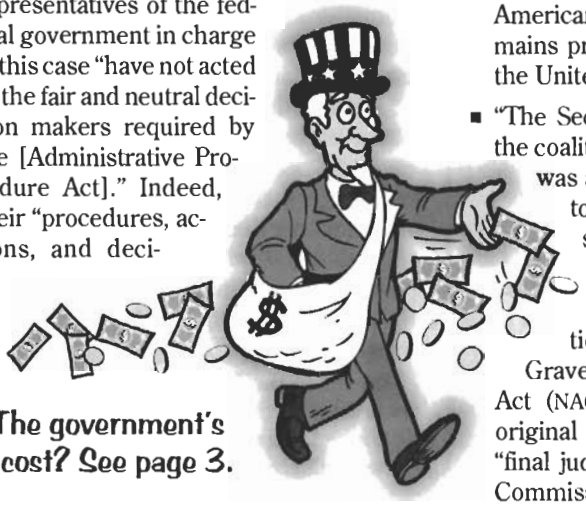
JUDGE RULES SCIENTISTS CAN STUDY KENNEWICK MAN

by Bradley T. Lepper

After 14 months of deliberating, weighing the evidence and arguments in more than 22,000 pages of documentation, U.S. Magistrate John Jelderks announced his decision regarding the fate of the 9,000-year-old remains of Kennewick Man—also known as the Ancient One. He affirms the right of scientists to study these remarkable bones while thoughtfully and thoroughly demolishing former Secretary of the Interior Bruce Babbit's decision to "repatriate" the remains to a coalition of Native American tribes.

In his detailed opinion, Jelderks rules that since the time the Army Corps of Engineers took possession of the remains, the representatives of the federal government in charge of this case "have not acted as the fair and neutral decision makers required by the [Administrative Procedure Act]." Indeed, their "procedures, actions, and decisions have consistently indicated a desire to reach a particular result." In other words, the Department of the Interior, for some reason, determined from the outset to give the bones to the Native American tribes regardless of their legal responsibility to consider fairly the interests and claims of the scientists and others who wished to have the opportunity to study the remains.



The government's cost? See page 3.

In his critique of Babbit's decision to repatriate the bones of Kennewick Man to a coalition of Native American tribes, Jelderks agrees with the key arguments presented by Alan Schneider and Paula Barran, the attorneys for the scientists. The following quotes are excerpted from Jelderks's decision:

- "The Secretary erred in defining 'Native American' to automatically include all remains predating 1492 that are found in the United States."
- "The Secretary erred in assuming that the coalition [of Native American tribes] was a proper claimant and in failing to separately analyze the relationship of the particular Tribal Claimants to the remains."
- The Secretary's determination that the Native American Graves Protection and Repatriation Act (NAGPRA) allows evidence of "aboriginal occupation" to substitute for a "final judgement" of the Indian Claims Commission in establishing aboriginal title to lands is "arbitrary and capricious, contrary to law, in excess of the Secretary's authority."
- "The Secretary's finding that the Tribal Claimants have satisfied the cultural affiliation requirement of [NAGPRA] is arbitrary and capricious, and must be set aside."

Is Kennewick Man a "Native American"?

Jelderks observes that the "plain language" of the law requires that there

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be "some relationship between remains or other cultural items and an existing tribe, people, or culture that is indigenous" to the United States, before those remains can be subsumed under NAGPRA. Jelderks concludes that the available evidence does "not support a finding that Kennewick Man is related to *any* particular identifiable group or culture, and the culture to which he belonged may have died out thousands of years ago." Therefore, "the Secretary did not have sufficient evidence to conclude that the Kennewick Man remains are 'Native American' under NAGPRA." This aspect of the ruling may have far-reaching implications for the applicability of NAGPRA to human remains more than a few hundred years old. It is important to note that Jelderks does not assert that Kennewick Man is *not* a Native American ancestor. He merely points out that the Secretary had not demonstrated that he is an ancestor of modern Native Americans. Jelderks states, moreover, that it would be surprising if pertinent evidence could be marshaled that would link remains more than 9,000 years old to any particular modern tribe.

Did the Coalition of Native American tribes have proper standing under NAGPRA to make a valid claim to repatriate Kennewick Man?

Jelderks addresses a number of technical points concerning Babbit's cultural affiliation determination that deserve mention. First of all, the Secretary concluded that the coalition of four federally recognized Indian tribes, and one group that is not federally recognized, constituted a proper claimant under the terms of NAGPRA. Jelderks observes that this "contradicts the plain language of the statute, which identifies the appropriate recipient in the singular as '*the* Indian tribe . . . which has the closest cultural affiliation.'" Jelderks states that the Secretary's interpretation

> could render part of the statute meaningless. Carried to the logical end, coalition claims would effectively eliminate the statutory requirement that cultural affiliation be established with a particular modern tribe. The more members in a coalition, the greater the likelihood that the remains or objects are affiliated with *some* member of the coalition, despite a lack of evidence establishing affiliation with any particular member of the coalition.

Jelderks also criticizes Babbit's determination that the tribal coalition had a legally sufficient claim to Kennewick Man based upon the fact that they once occupied the land where his remains were found. NAGPRA requires that the land claim must have been upheld by a "final judgement" of the Indian Claims Commission (ICC). The land in question here was not included in any such final judgment by the ICC. Jelderks wryly notes that this "should have been the end of the matter," but the Secretary "misconstrued" the law and "erred in interpreting [it] in a manner that would apply it to situations not included within its plain language." Jelderks determines the Secretary's actions were "arbitrary and capricious, contrary to law, in excess of the Secretary's authority."

Are the Native American tribes requesting the repatriation of Kennewick Man demonstrably culturally affiliated with him?

NAGPRA states that a finding of "cultural affiliation" with human remains, such as Kennewick Man, requires proof of "a relationship of shared group identity which can reasonably be traced . . . between a present day Indian tribe . . . and an identifiable earlier group" to which the deceased person belonged. Jelderks concludes that Secretary Babbit's determination that Kennewick Man was culturally affiliated with the tribal coalition "cannot be sustained":

> The Secretary: (a) did not adequately determine 'an identifiable earlier group' to which the Kennewick Man allegedly belonged, or even establish that he belonged to a particular group, (b) did not adequately address the requirement of a 'shared group identity,' (c) did not articu-

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late a reasoned basis for the decision in the light of the record, and (d) reached a conclusion that is not supported by the reasonable conclusions of the Secretary's experts or the record as a whole.

The Decision

For all these reasons, Jelderks concludes that "NAGPRA does not apply to the remains of Kennewick Man." Since Jim Chatters's original investigation of the Kennewick Man site was done under the terms of a permit issued by the Army Corps of Engineers in accordance with the Archaeological Resource Protection Act (ARPA), Jelderks has determined that this was the relevant federal law for determining the disposition of the remains. He notes that research conducted under ARPA must be "undertaken for the purpose of furthering archaeological knowledge in the public interest" and that a requirement of ARPA is that "objects be curated and preserved after excavation or removal." Therefore, Jelderks has ordered that "[the scientists'] request for access to study be granted, subject to the type of reasonable terms and conditions that normally apply to studies of archaeological resources under ARPA."

Response of Scientists

In a statement released on the Web pages of the Friends of America's Past, the scientists' attorneys report that "the scientists view the court's decision as confirmation of their contentions that the American past is the common heritage of all Americans, and that it should be open to legitimate scientific research."

In an interview with *Archaeology* magazine, James Chatters, the first scientist to encounter the remains of Kennewick Man (but not a plaintiff in the litigation), says that, on learning of the decision, he "experienced a tremendous feeling of relief, followed by a sense of validation that taking a stand for science, and advocacy for Kennewick Man, had been the right things to do."

Robert Kelly, the President of the Society for American Archaeology, says that "Judge Jelderks' decision in the Kennewick case will go a long way toward restoring the balance between the interests of science and those of Native Americans that Congress mandated when it passed NAGPRA."

Response of Native Americans

In the wake of Jelderks's decision, the Confederated Tribes of the Umatilla Indian Reservation expressed their disappointment in a public statement that drastically exaggerated the scope of the ruling. The Umatilla stated their concern that the decision "removes any barriers that would prevent the Plaintiff scientists from demanding access to all Native American human remains, for their scientific needs, regardless of whether the remains were 20 or 20,000 years old." Subsequently, the Umatilla joined with the Colville, Yakima, and Nez Perce Indians in appealing the decision. Nez Perce attorney Rob Roy Smith says, "This is just the beginning of a long appeal road. We are committed to getting a successful resolution."

Susan Shown Harjo, a Cheyenne and Hodulgee Muscogee writing for *Indian Country Today*, harshly criticizes the decision. She writes that Jelderks was "overwhelmed" by the extensive

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$3 Million and Counting!

Since Magistrate Jelderks issued his decision in the Kennewick Man lawsuit, Alan Schneider of Portland, Ore., the lead attorney representing the plaintiffs Bonnichsen et al., *has taken a cold, hard look at the case. His attention isn't on the facts in the case, but on dollars—the grand total of all the expenses incurred so far by the U.S. government and its agencies in the 6-year court fight to defend their peremptory decision to award a 9,300-year-old skeleton to a coalition of Indian tribes.*

In his report **Kennewick Man: The Three-million-dollar Skeleton,** *Schneider spells out the cost to you and me, because we are footing the bill for the government's squandering of funds—tax dollars—to defend a decision made in haste. He estimates that bill at over $3 million. And it's still climbing!*

Following are excerpts from Schneider's report, which you must surely agree reads like a financial nightmare. To view the entire report, log on to ***Web site www.friendsofpast.org***

Kennewick Man: The Three-million-dollar Skeleton

by Alan L. Schneider

The Kennewick Man skeleton is probably the most publicized human skeleton ever found in North America. It may also be the most expensive. Federal government spending on the skeleton and related matters totals at least $1,100,000 so far and probably as much as $3,000,000 (or more). The ultimate total will increase even further, possibly by millions, as the lawsuit over the skeleton's fate continues to unfold.

The magnitude of these expenditures has been fueled in part by government extravagance and waste. Hundreds of thousands of dollars have been spent on matters that could have been obtained for free or for little cost, and thousands more have been spent on matters that serve little useful purpose. While these amounts may seem small in the context of trillion dollar budgets, they do bring to mind an observation made by one of Tony Hillerman's fictional characters:

> It's a political law. Like physics. When a federal agency gets into something, the number of tax-paid people at work multiplies itself by five, the number of hours taken to get it done multiplies by ten, and the chances of a successful solution must be divided by three. . . . —*The Wailing Wind*, 2002, p. 118.

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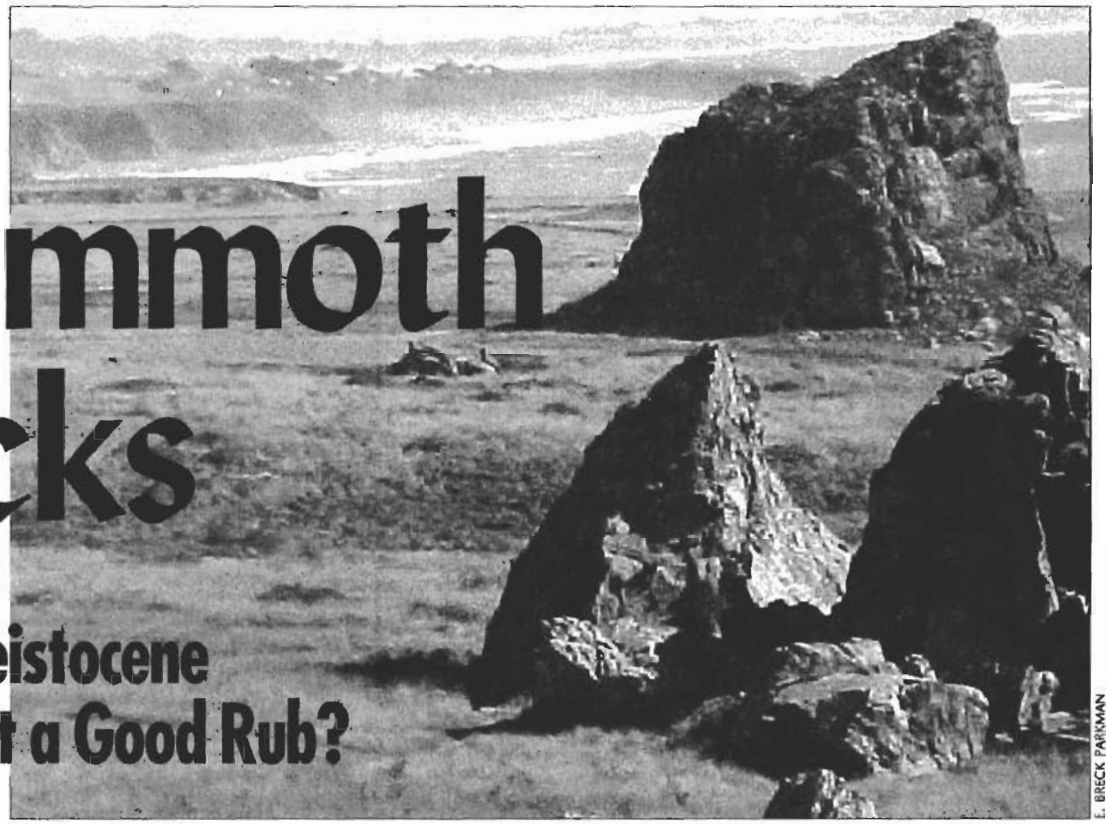
Mammoth Rocks

Where Pleistocene Giants Got a Good Rub?

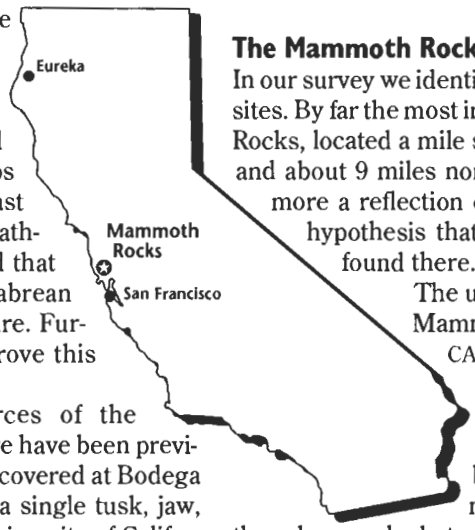


E. BRECK PARKMAN

Looking south at the Mammoth Rocks site (2001). Locus 1 is the rockstack in the foreground, Locus 2 is the large rockstack in the background, and Locus 3 is the squat boulder at left center.

by E. Breck Parkman

SOME UNUSUAL GEOLOGICAL FEATURES were found during a survey in April 2001 of Sonoma Coast State Beach (or simply, the Sonoma Coast), a unit of the California State Park System located about 50 miles north of San Francisco and extending from the mouth of the Russian River south to Bodega Bay. On an uplifted marine terrace Raj Naidu, a local paleontologist, and I observed on blueschist and chert outcrops highly polished areas that may be the result of animal rubbing. The "rubs" appeared to us to be located on intentionally selected accessible surfaces, especially along intersecting edges, at overhangs, and on the leeward sides of the rocks. The rubs range from ground level to a height of at least 13 ft; those found above 6 ft are more weathered. After additional study, I've concluded that the upper rubs are probably of Rancholabrean origin. Of course, this is still only conjecture. Further research is planned to prove or disprove this hypothesis.



Although the paleontological resources of the Sonoma Coast are relatively unstudied, there have been previous discoveries. In 1972 Dr. James West discovered at Bodega Head the partial remains of a mammoth—a single tusk, jaw, and tooth—which are now curated at the University of California Museum of Paleontology in Berkeley. Then in 1991 Raj Naidu identified a buried fossil conifer deposit at Bodega Head. Other Rancholabrean-era fossils have been found throughout the region, including a nearby site on the Estero de San Antonio that yielded the remains of mammoth, mastodon, and bison.

The Mammoth Rocks Site

In our survey we identified several Sonoma Coast rubbing rock sites. By far the most impressive is a site I've named Mammoth Rocks, located a mile south of the mouth of the Russian River and about 9 miles north of Bodega Bay. (The site's name is more a reflection of the behemoth-size rocks than of my hypothesis that mammoths created some of the rubs found there.)

The uplifted marine terrace on which lies the Mammoth Rocks site dates to about 40,000 CALYBP. In the late Pleistocene, when glaciers bound up enormous amounts of water and reduced sea level as much as 425 ft, the Sonoma Coast was a series of broad coastal terraces extending 7–9 miles west of today's shoreline. Although no paleobotanical reconstruction has been done for this general area, it's likely the now-submerged terraces were grassland or savanna environments. The interior edge of the

present coastal terrace was probably coniferous forest, similar to that identified further south in western Marin County. A closed-cone pine forest dominated by Monterey pine (*Pinus radiata*) characterizes the well-known late-Pleistocene Millerton Formation from Tomales Bay. Dated to approximately 30,000 CALYBP, the forest included various woody and herbaceous plants found in the area today.

The Mammoth Rocks site consists of three loci separated by about 1,200 ft. Locus 1, where the majority of the rubs are found, is a 60-ft-tall rockstack composed primarily of blueschist; rubs here occur to a height of 13 ft. Locus 2, 1,200 ft south of Locus 1, is a 96-ft-tall rockstack of blue schist and other schistose materials; there's a minor amount of rubbing on the north side of the rockstack up to about 8 ft. Locus 3, 120 ft northeast of Locus 2, is a squat blueschist boulder about 30 ft across and 10 ft high; its northeastern side has been heavily rubbed to a height of about 8 ft.

The rubs found at Mammoth Rocks and at the other Sonoma Coast sites occur only on rock faces that herbivores could have reached. The areas most heavily rubbed are the edges of intersecting rock faces. Almost every accessible edge has been rubbed, and there are also numerous rubs on broad vertical faces.

A check on local history finds the area was heavily grazed for a century before 1980. Since domestic cows and horses have a shoulder height of under 6 ft, it's likely rubs lower than 6 ft high can be attributed at least in part to historic grazing animals. However, the higher rubs (6–13 ft) appear to predate historic grazing. In fact, the majority of upper rubs cluster around 10–12 ft.

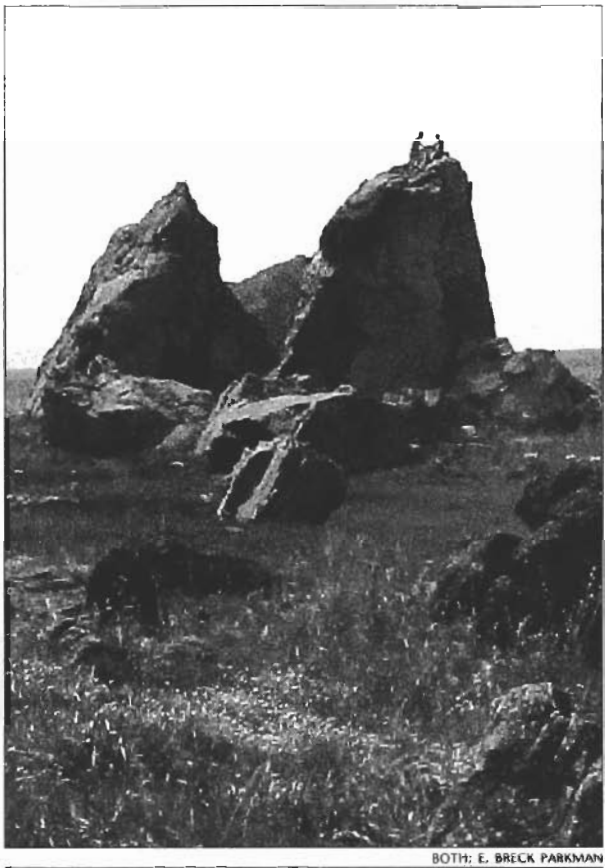
Other North American Rubbing Rock Sites

Similar rubbing rock sites are thought to occur at Hueco Tanks State Park in Texas and 30 miles to the west at Cornudas Mountain in New Mexico. Both sites have rubs to about 10 ft high. In 1941 Walter Lang, a geologist with the U.S. Geological Survey, visited the sites and identified what he believed to be animal rubs. In 1946 he examined a sample of the glassy polish from Cornudas and found that the surface was coated with opalized silica to a depth of about 0.5 mm. To determine whether animal oil or fat was present, he pulverized a sample of the rock and treated it with carbon bisulfide. After the solvent evaporated, a spot of honey-yellow oily matter remained. Lang deduced that fine silica dust mixed with oily fats had been rubbed onto the rocks by animals during earlier times; the silica had weathered to opal and the animal oil had slowly vanished, forming the thin skin of opal residue on the rock surface.

There are numerous rubbing rock sites on the Northern Plains, especially in the Canadian Provinces of Alberta and Saskatchewan. Most of these sites are referred to as "buffalo rubbing rocks." It's well known that North American bison often rub against rocks to relieve itches and dislodge flies.

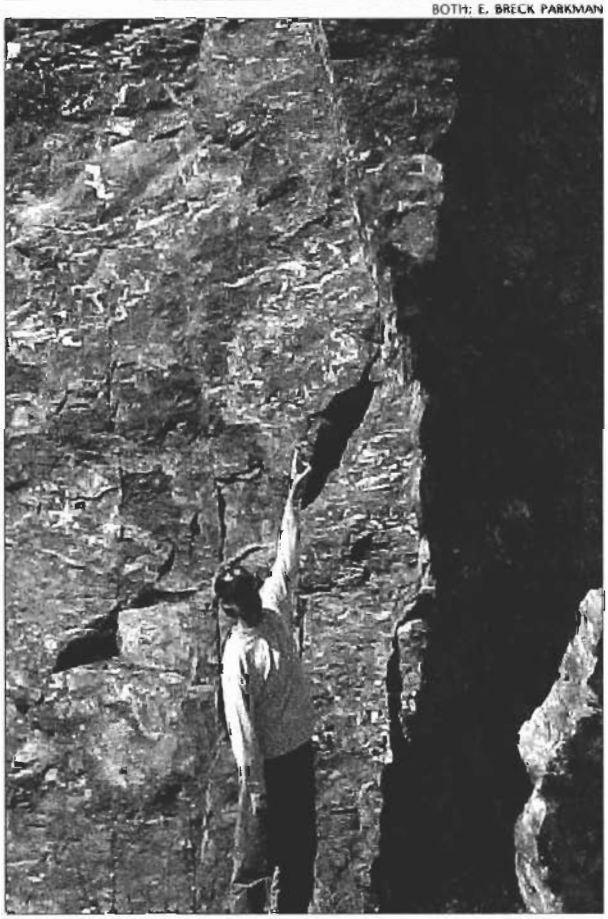
Megaherbivores and Rubbing Rocks

The area of the world that in recent times had a megafaunal menagerie comparable to that of Pleistocene California is in eastern and southern Africa. In southern Africa, rubbing rocks are fairly common in the savanna and grassland areas. African herbivores—elephant, rhino, zebra, and

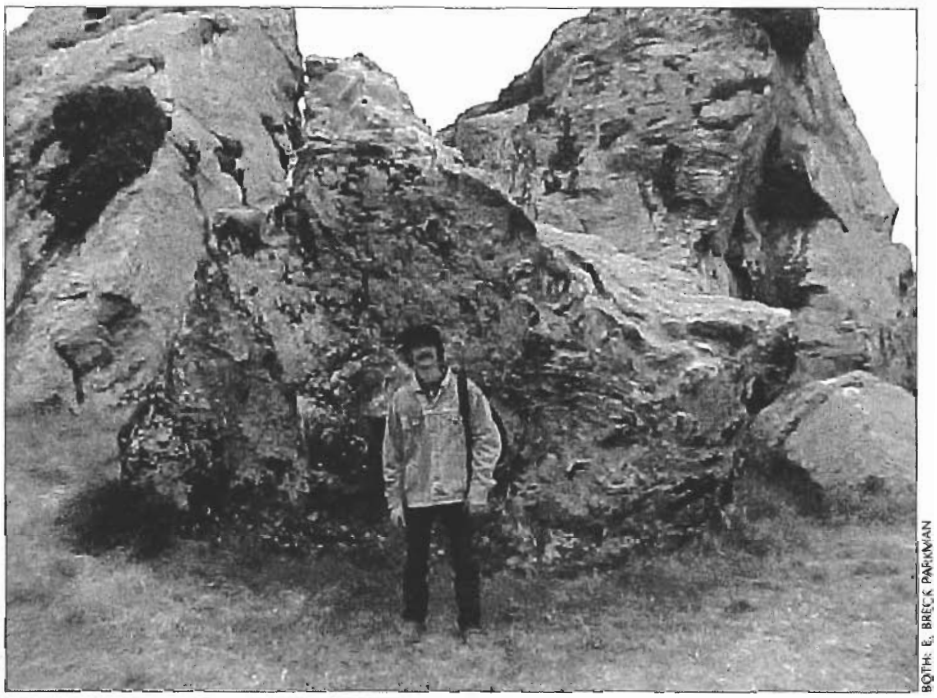


BOTH: E. BRECK PARKMAN

This broken rockstack is Locus 1 (2002). The climbers on top give an idea of the immensity of the formation.



State Park Resource Ecologist Brendan O'Neil points to rubs along the edge of two intersecting rock walls that extend up to 13 ft above the surface at Locus 1 (2001).



BOTH: E. BRECK PARKMAN

Paleontologist Raj Naidu, codiscoverer of the Mammoth Rocks site (2001), stands before a heavily rubbed overhang—the kind preferred for rubbing—extending up to 12 ft. above the surface (*below*). A possible buried and compacted paleosol has been detected where Raj is standing.

buffalo—rub against rocks, tree trunks, and termite mounds, usually after bathing, to rub off mud and ectoparasites. Rubbing stones in southern Africa are occasionally found decorated with rock art.

A variety of Rancholabrean species likely used rubbing rocks. Barring catastrophic ground erosion during the historic era, it's obvious that domestic animals—cows, horses, and sheep—standing 6 ft or less at the shoulder can't have created rubs 13 ft. above the ground. However, Rancholabrean megaherbivores like the Columbian mammoth could have rubbed at much greater heights. Rancholabrean species likely to have used rubbing rocks in our survey area include Columbian mammoth (*Mammuthus columbi*), 12–14 ft at the shoulder; mastodon (*Mammut americanum*), 7½–9¾ ft; ancient bison (*Bison antiquus*), 7 ft; long-horned bison (*Bison latrifons*), 8 ft; western horse (*Equus occidentalis*), 5 ft; Harlan's ground sloth (*Glossotherium harlani*), 6 ft; and camel (*Camelops hesternus*), 7½ ft.

Testing the Rancholabrean Hypothesis

In order to test the hypothesis that the Mammoth Rocks were used by now-extinct Rancholabrean megaherbivores, I need to do further research. First, I'll have to sample the areas immediately around the rubbing rocks and in the general terrace area to see whether there's a fossil plant phytolith record. Like modern elephants, mammoths required an enormous quantity of food, probably more than 700 lb a day. The typical elephant produces 300–400 lb of dung a day, and the Columbian mammoth probably produced considerably more. Since mammoths, like elephants, digested less than half of what they ate, mammoth dung contains a high amount of unprocessed vegetal matter. Based on Jim Mead and Larry Agenbroad's analysis of mammoth dung recovered from the Southwest, we know that grass and sedge were the preferred foods. Indeed, the analysis of 25 fragments of mammoth dung from Bechan Cave, Utah, indicates that more than 95 percent of each bolus consists of a matrix of grasses, sedges, and rushes, and less than 5 percent consists of browse items.

We know that mammoths selected certain food plants. If they also utilized the rocks as I think they did, it may be possible to find evidence of their preferred food in plant phytoliths recovered from the area immediately

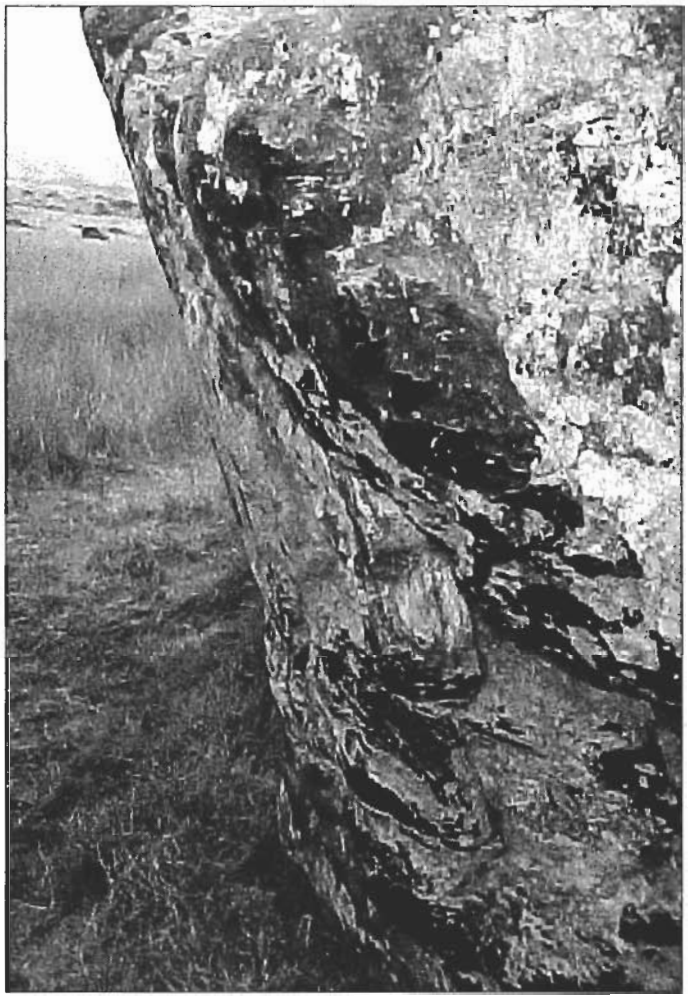
E. BRECK PARKMAN

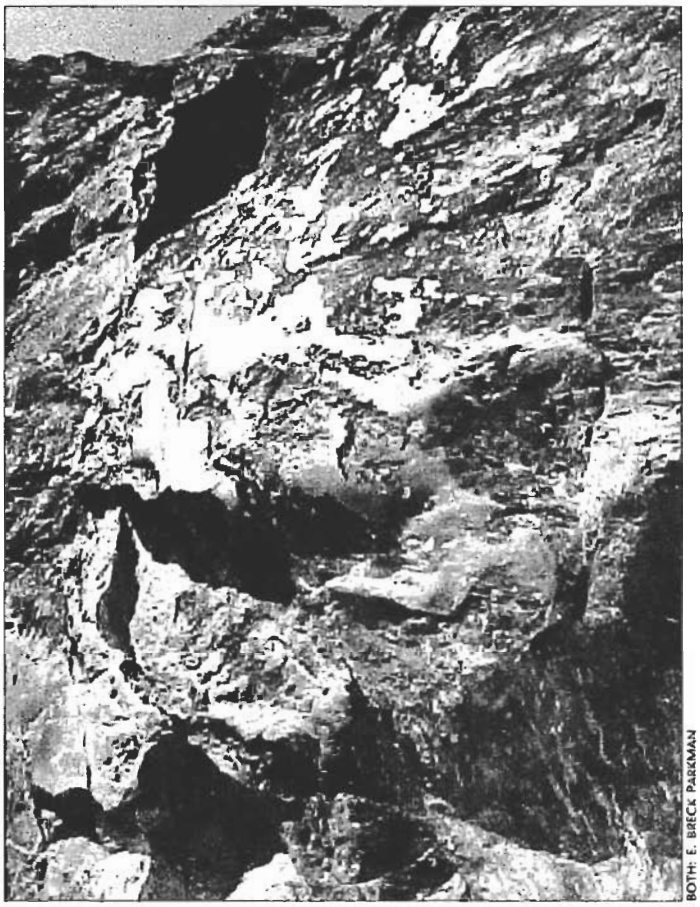
Geology professors Rolfe Erickson and Steve Norwick of Sonoma State University remove a rock sample from Locus 1 (2002).

around the rubbing rocks, compared with the surrounding terrace area.

CSFA director Rob Bonnichsen and others have documented the presence of fossil hair in archaeological and paleontological contexts. If the polished surfaces at Mammoth Rocks were rubbed to the degree they appear, animal hair would have been shed in significant quantity and some may still be present in the surrounding soil. In order to test for the presence of fossil hair, an archaeological excavation will be conducted adjacent to a heavily rubbed overhang in Locus 1. The area to be tested includes a buried compacted layer at a depth of 2 ft, which may be a paleosol compacted by the concentrated weight of herd animals.

Ancient DNA (aDNA) can be recovered from specimens at least 50,000–100,000 years old. Since Mammoth Rocks has a relatively late Rancholabrean history—from the initial uplift of the marine terrace at about 40,000 CALYBP to the megafaunal extinctions of 12,000–10,000 CALYBP—any aDNA found there won't necessarily be degraded. Analysis of viable aDNA will be crucial to identifying the kinds of animals that utilized the site.





BOTH: E. BRECK PARKMAN

Rubs at Locus 1 extending up to 7 ft (*left*) and 13 ft (*above*) (2001).

Finally, it'll be necessary to examine the suspected rubs themselves. Thin sections from three samples were recently examined at 20,000x magnification using a scanning electron microscope. Steve Norwick and Rolfe Erickson, geology professors at Sonoma State University, have determined that the polish is unlike any natural rock polish they've ever seen. Furthermore, they rule out natural processes like wind or water erosion as the agent. The suspected rubs will be compared under magnification with wear patterns on rubbing stones known to have been used by large herbivores. We're now awaiting elephant and rhino rubbing post samples from the Johannesburg Zoo.

Recent studies elsewhere have documented the penetration of blood into microcracks in rocks. Consequently, blood residue may have been deposited on the rubbing rocks by injured animals. If so, it can be used to identify the species of animals that utilized the rubs, just as mammoth and other Rancholabrean species have been identified by blood residues found on Paleoamerican stone tools. Moreover, although it's likely that any aDNA deposited on the rubbing rocks has long since degraded, we can conceive scenarios that may have preserved trace amounts. For example, if aDNA were deposited in microcracks and the rock surface were then coated with silica, the silica might prevent the aDNA from degrading. Walter Lang's observations from Cornudas Mountain lend support to such a possibility. Indeed, the body oils of megaherbivores could serve as a preservative, just like the clay that was rubbed onto the rocks following mud baths of mammoth and bison. (It's likely that clay from the mud-encrusted animals is responsible for the glassy polish observed at the site.)

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Hunting Pre-Clovis in Siberia

FOR MOST SCIENTISTS studying the peopling of the Americas, the primary question underlying their research boils down to this: Who was first?

As recently as a decade ago, there was general consensus concerning the identity and origins of the first Americans. All the credible evidence pointed toward the Clovis people, whose distinctive lithic assemblage has been found at sites throughout North America. According to the traditional model, Clovis antecedents entered the New World from Beringia no earlier than 11,500 RCYBP (13,500 CALYBP)—a thesis supported by radiocarbon data from dozens of Clovis sites.

Occasional finds suggested that other groups had arrived first, but problems with stratigraphy and chronology made this possibility difficult for most researchers to accept.

More recent finds, however, have cast doubt on the Clovis-first scenario. Sites like Monte Verde, Chile; Pedra Furada, Brazil; Cactus Hill, Virginia; and Topper, South Carolina, strongly indicate a pre-Clovis presence in the New World. These finds, combined with a lack of proto-Clovis sites in Beringia, have caused some researchers to look elsewhere for the ancestors of the first Americans. Some suggest a Southeast Asian origin, while others postulate a link to the Solutrean peoples of Europe. But some researchers aren't buying the new theories. They're still focusing on eastern Siberia, searching for sites that might link Clovis to the Old World.

Ushki: A New Hope for Beringia

Models focusing on Northeast Asia usually propose either of two types of routes for the peopling of the Americas: an overland migration across Beringia by way of an ice-free corridor, or a coastal migration route via the Arctic Sea. The Ushki sites in central Kamchatka have long been considered strong candidates for a proto-Clovis occupation in Siberia; geographically they're in a position to answer questions about coastal and interior migration options. Discovered in 1964 by Nikolai Dikov, the Ushki sites are scattered along the south shore of Ushki Lake, an oxbow that was still a bend of the Kamchatka River during Pleistocene times. The sites, all of which occur in the sandy point-bar deposits of the second terrace above the river, saw heavy use by the prehistoric peoples of the region.

TED GOEBEL & MIKE WATERS

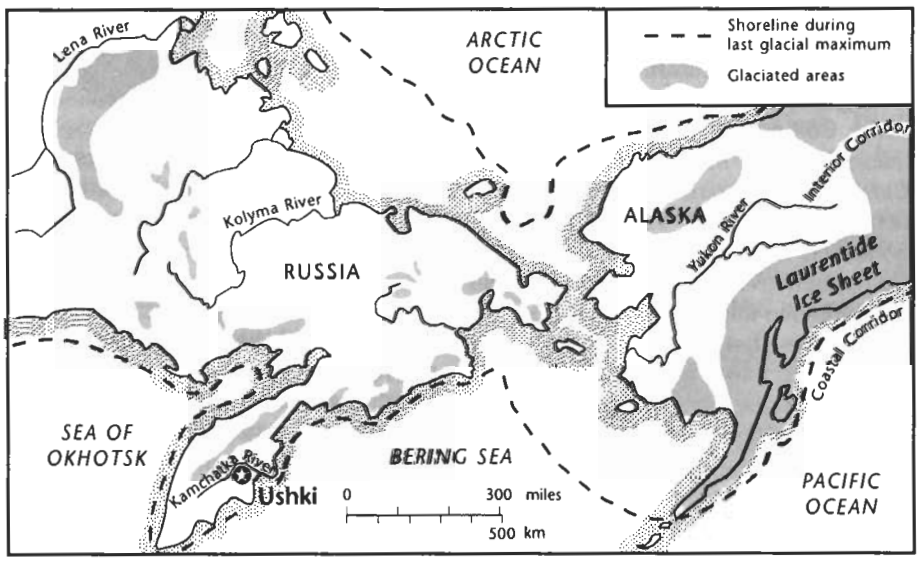
The Ushki-1 site, seen from Ushki-5. Kliuchevskii Volcano rises in the background.

Dikov spent three decades excavating at Ushki Lake. Over the years he unearthed a dazzling array of artifacts and features dating back more than 10,000 years, all encased in a 3-m-thick packet of sediments arranged in a classic "layer-cake" stratigraphy. At the Ushki-1 site, Dikov identified seven distinct cultural components, including Component VII, a small but well-defined lithic assemblage consisting of blades and blade cores in association with stemmed and lanceolate points. The tool assemblage of Component VII is unique for Beringia, and Dikov's radiocarbon samples produced dates clustering around 14,000 RCYBP (about 16,800 CALYBP). Although no Clovis-style fluted points were found at

Ushki, the Component VII assemblage generally resembles known Clovis assemblages and seems old enough to be an excellent candidate for a Clovis antecedent.

Dikov died before he could publish a comprehensive report on his findings, but his work was carried on by his wife and longtime collaborator, Margarita Dikova, Director of the Archaeological Laboratory in Magadan, Russia. In 1999, Dr. Dikova invited Ted Goebel and Mike Waters, of the University of Nevada–Reno and Texas A&M University respectively, to conduct joint excavations at Ushki during the Year 2000 field season. Both men are seasoned veterans in the field of Siberian archaeology, having previously worked together at ancient sites in the Transbaikal. Dr. Waters has also conducted research at the Diring Yuriak site in Yakutia, where he helped date artifact-bearing sediments to 260,000 years ago. When he's not searching for Clovis precursors in Siberia, Dr. Goebel heads the Sundance Archeological Research Fund, which investigates Clovis and pre-Clovis sites in the Americas (see "A Campaign to Find the First Americans" in this issue). Waters is Associate Director of **CSFA** and Executive Director of the North Star Archaeological Research Fund, a sister of the Sundance Fund. For the new excavations at Ushki, the two would act in concert with Dikova as principal co-investigators.

Year 2000 Excavations at Ushki, Kamchatka



Beringia, showing the location of the Ushki sites.

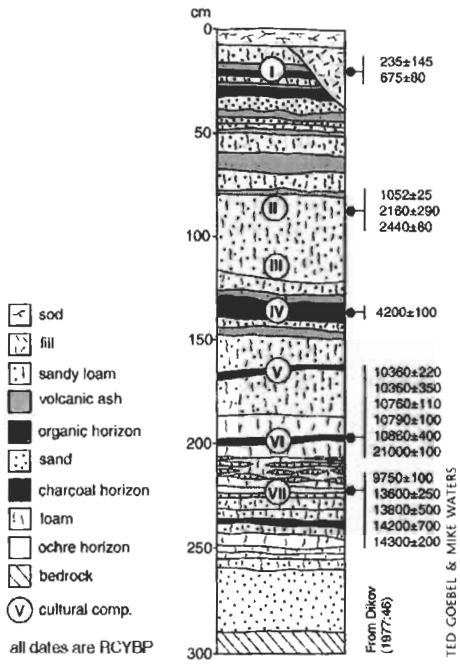
Off to Ushki

In late August 2000, Goebel and Waters met Academician Dikova in the Russian city of Petropavlovsk and proceeded by car to Ushki, accompanied by a team of Russian and American colleagues. Their goals were clear-cut. Primarily, they wanted to clarify the geologic contexts of the earliest Ushki components (especially in regards to potential cryoturbation and groundwater contamination), establish the ages of those components, and determine the nature of the artifact assemblages from each component. All these were crucial, because if Dikov was right—if Component VII really did predate Clovis—then Ushki might provide the strongest evidence yet for a Clovis ancestor in Beringia.

Initially the team had intended to excavate at Ushki-1. But upon arriving at the site, they found that nearly all the Pleistocene sediments at Ushki-1 were gone, removed by Dikov's extensive excavations. They stayed just long enough to sink a single 1-by-1-m unit down to the Component VI and VII layers and to record a stratigraphic profile on the lakeshore, collecting radiocarbon samples from both locations. Fortunately, Dikov had also identified Components VI and VII at nearby Ushki-5, so the focus shifted to that site. Dikov had excavated the site in the 1970s, but plenty of the ancient sediments remained. In an area of Ushki-5 lying on a small cape that juts into the lake, the team opened up two excavations, a 1-by-2-m test unit at the top of the cape that exposed a complete stratigraphic profile for sedimentological analysis, and a 4-by-5-m block excavation located alongside a 1-m-wide trench previously excavated by Dikov.

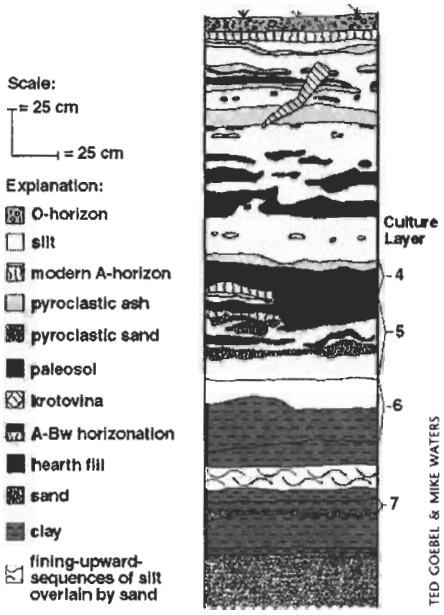
The first 130 cm (52 in) of sediments consisted of the surface soil and a series of volcanic ash deposits, interleaved with several paleosols—all culturally sterile. Their efforts were rewarded when they reached Dikov's "Chornyi Gumus," a thick, dark paleosol that dates to about 4,000 RCYBP (uncalibrated); this stratum produced stone tools belonging to Dikov's Component IV, in association with a storage pit and a hearth. Component VI artifacts began to appear approximately 200 cm (80 in) below the surface (Component V wasn't obviously present at Ushki-5). In the block excavation, Component VI yielded, in addition to microblades and wedge-shaped cores, the remains of a Pleistocene dwelling 5 m (16½ ft) in diameter. The feature is distinguished by a charcoal-smeared floor, a distinct shoulder that extends around its entire circumference, and an "arctic entry" passage (think igloos). The excavators also found a post hole and a well-preserved stone-lined hearth. The house had been dug by its creators some 30 cm (12 in) into underlying sediments, and ironically Component VII artifacts, including a stemmed point and a burin, were found in the house pit backdirt.

Underlying Component VI, and stratigraphically separated from it by 30

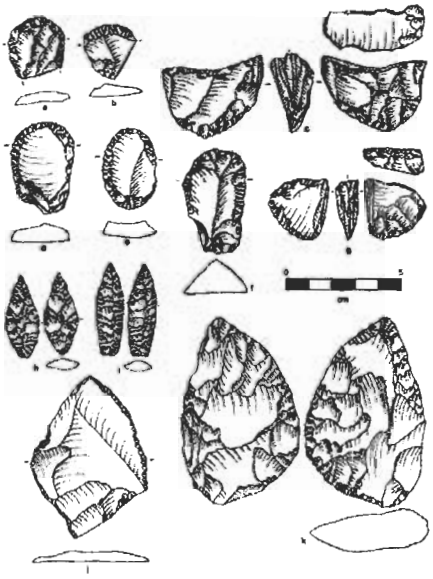


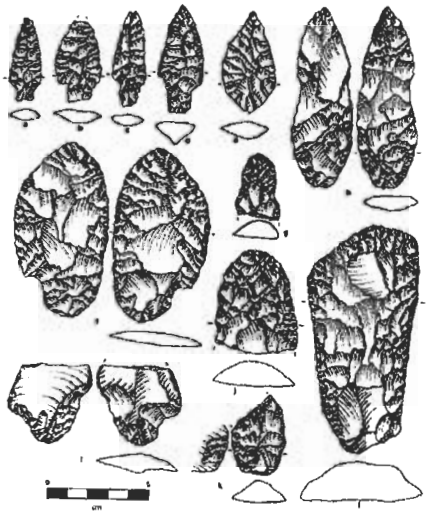
◀ Generalized stratigraphic profile for Ushki-1, based on Dikov's excavations.

Generalized stratigraphic profile for ▶ Ushki-5, based on the Y2K excavations.



cm of sterile sediments, was Component VII. This horizon, less than 3 cm (1¼ in) thick, exhibits evidence of both fluvial and biological disturbance. Nonetheless, the team uncovered two unlined hearths consisting of slightly dispersed concentrations of burnt bone, charcoal, and ash, surrounded by a low-density scatter of lithic artifacts. The artifacts recovered included several stemmed points, side scrapers, and retouched flakes, all small pieces made of local cherts, chalcedonies, and basalts.





Lithics from Components VI (*above*) and VII (*right*) at Ushki-1.

BOTH: TED GOEBEL & MIKE WATERS

Questions Answered at Ushki-5

The Year 2000 excavations at Ushki were a resounding success and are still producing data that may change how archaeologists look at Siberian sites. Most of the questions that Goebel and Waters hoped to answer have been answered. To begin with, they've verified that the Component VI and VII cultures are stratigraphically distinct, just as Dikov reported. Both cultures are technologically distinct as well: Component VI is a microblade technology like those common throughout Beringia 10,500 RCYBP (12,200 CALYBP), while Component VII definitely lacks microblades—it more closely resembles Clovis in this regard than does Component VI. Component VI is a beautifully preserved thick occupation layer, while Component VII is not. Although no cryoturbation was observed in the profile, it's obvious that fluvial processes and bioturbation have disturbed Component VII. The relative ages and geologic contexts of Components VI and VII have been resolved.

Finally, the Component VI and VII occupations have been definitively dated—even though the dates obtained aren't what the Ushki team expected. The question of groundwater contamination of the Component VI and Component VII radiocarbon samples was addressed by dating charcoal-humate pairs—that is, both the insoluble and the soluble organics—from the same layers. The results matched, so it's clear that groundwater contamination isn't a problem at Ushki.

Expectations vs. Results

While the Ushki excavations answered all the research questions Goebel and Waters had posited, one thing didn't work out as they'd anticipated. The new dates obtained for Component VI closely resemble Dikov's dates, but the Component VII samples do not: apparently Dikov's dates for Component VII were simply wrong. Here is how the two sets of dates compare.

Cultural Component	Dikov (RCYBP)	Y2K (RCYBP)
Component VI	10,700	10,350
Component VII	14,000	11,000

Waters and Goebel aren't sure why their Component VII radiocarbon ages differ so radically from Dikov's. Perhaps, Goebel surmises, the differences arose because Dikov took his samples from near the bottom of Component VII and the Y2K team took theirs from near the top. Or perhaps it had to do with the way Dikov's samples were processed. Waters believes the latter situation is most likely. For now, the discrepancies remain a mystery. Only one thing is certain: if the Y2K radiocarbon results are correct, as both Waters and Goebel believe, then Ushki had little to do with the origins of the first

Americans. At best, Clovis and Ushki's Component VII are "cousin" cultures, sharing a heretofore-undiscovered common ancestor.

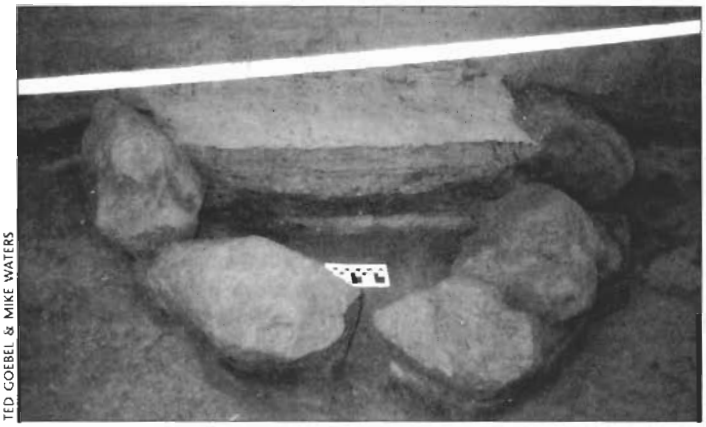
The next step for the Y2K team is to begin a detailed analysis of Dikov's Ushki assemblages. The Y2K lithic and faunal analyses will be reported soon, as will other aspects of the fieldwork, although the tephra analysis still awaits completion. As for the Ushki sites themselves, plenty of work remains to be done. Among the most pressing questions that need to be answered are these: Why is a non-microblade horizon conformably overlain by a microblade horizon? Why did this shift occur so quickly? Microblade horizons appear in Alaska, Kamchatka, and elsewhere in Beringia at the same time, about 12,200 years ago. Does this generalized microblade complex represent a single population, or an example of rapid cultural diffusion in the face of changing environmental conditions? "I'd love to go back and study Ushki in terms of long-term Pleistocene adaptation," says Goebel. "Right now I'm not ready to do that, but a year or two down the road I might be."

After decades of debate, researchers still lack a clear picture of who the first Americans were or when they arrived, although the picture is less fuzzy than it once was. Most still believe Beringia offers the most likely route for human entry into the New World; all it required was a long overland migration. By contrast, most other theories require relatively high levels of maritime technology on the part of the proto-Americans. While these theories can't be discounted, Occam's Razor suggests that the most obvious answer is the most likely. Beringia is a vast, forbidding environment that remains largely unexplored in archaeological terms; even if we haven't found them yet, sites linking Siberia and Clovis may await future discovery. Until then, it's too early to settle the first-Americans debate.

Despite the unexpected radiocarbon results from Ushki, Goebel and Waters haven't given up on Beringia. "We'll continue our search for Paleo-American ancestors in other parts of Siberia," Waters declares. He still favors in-migration through Beringia, but concedes that other routes are possible. "The explosion of information over the last decade in first-American studies has been phenomenal. We now have many options to consider." Goebel agrees, but remains a staunch Siberian-origins proponent; he has no patience for most alternate explanations for the peopling of the Americas. All the physical and genetic evidence is in favor of the Beringian model, as he points out. But where's the archaeological evidence?

"It's there," Goebel states confidently. "It just hasn't been unmasked yet."

–Floyd B. Largent, Jr.



TED GOEBEL & MIKE WATERS

A lined hearth from Component VI of Ushki-5, dated to about 10,000 RCYBP. (The white stripe is an excavation string.)

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A Campaign to Find the First Americans

One couple is funding research—across the entire country!—to find the first immigrants

LIKE A MILITARY OFFENSIVE across a broad front, the Archaeological Research Funds endowed by Joe and Ruth Cramer are attacking the question, When did the first Americans appear here?

Just as you would expect of a carefully planned military campaign, the strategy has been well thought out: divide the United States into five regions of archaeological interest; select five universities with the resources needed first to prospect for sites likely to bear evidence of early Americans, then to excavate identified sites; appoint as Executive Director at each university a scientist—a teaching professor, tenured or on a tenure track—with the training and experience it takes to plan and execute research; then endow a Fund at each university with enough money to fuel research in the region in perpetuity.

It has taken 12 years to set up the full family of Archaeological Research Funds:

- **Sundance** at University of Nevada–Reno, Executive Director Ted Goebel (region: the Great Basin)
- **Quest** at Southern Methodist University, Executive Director David Meltzer (region: the central and southern Great Plains)
- **Argonaut** at University of Arizona, Executive Director Vance Holliday (region: the Southwest and northern Mexico)
- **North Star** at Texas A&M University, Executive Director Mike Waters (region: the East and Southeast)
- **Odyssey** at University of Kansas, acting Executive Director Rolfe Mandel (region: the greater midcontinent)

The terms of the charter for the Funds are explicit: research is planned during the academic year, and field work is carried out *full-time over the entire summer.* (Odyssey, the newest member of the family, is so new a permanent Executive Director has yet to be named. The position will be filled based on response to an advertised invitation for applications. Dr. Mandel, serving as caretaker, is planning next summer's activities so that Odyssey, as he puts it, "can hit the ground running.")

An ambitious program devised by a remarkable man

There is no foundation to administer the Archaeological Research Funds, no multi-tiered bureaucracy of planners, accountants, and lawyers, no office personnel. Cramer oversees and

RUTH CRAMER

The architect and leaders of the Archaeological Research Funds: 1, David Meltzer, Quest Executive Director; 2, Rolfe Mandel, Odyssey acting Executive Director; 3, Don Fowler, former Sundance Executive Director; 4, Fred Nials, Sundance consultant in geoarchaeology and Quaternary geology, University of Nevada–Reno; 5, Gary Haynes, Sundance trustee, University of Nevada–Reno; 6, Mike Waters, North Star Executive Director; 7, Joe Cramer; 8, Rob Bonnichsen, North Star Associate Executive Director; 9, Ted Goebel, Sundance Executive Director. Not shown is Vance Holliday, Argonaut Executive Director.

coordinates all activities personally from the family home in Denver. Although Ruth takes no part in day-to-day operations, she's a full partner in all the Funds because, says Cramer, "We own everything together."

Cramer doesn't need advice on the direction he wants research to take, since he's a trained geologist and long-standing avocational archaeologist. He was born to 1908 homesteaders in New Mexico in 1919. (It's tempting to infer a connection between his lifelong passion for archaeology and his birthplace, Clovis, which gave its name to the fluted weapon tips of the earliest known Americans, but he shrugs off the suggestion.) When he was 11 he became fascinated with geology and archaeology. Archaeology had to wait.

As a professional geologist, Cramer first worked for Standard Oil and Gas Company of Indiana for 10 years. In 1954 he moved to Denver to begin his career as an independent oil explorer—a successful career, for he was able to retire comfortably in 1969 and devote his energy to archaeology. Reflecting on his life, he notes that he has spent more time, since retiring, as an avocational archaeologist than he did as a professional geologist.

Enlarging the exploratory window

Although the overall mission of the Funds is to expand our understanding of early Americans in the Pleistocene and early Holocene—prior to 8000 RCYBP—there is an additional, very special component. After more than 30 years of study and independent research, Cramer proposes a hypothesis about the peopling of the Americas. Since it is nothing more than a theory, it will require many years of research to prove or disprove.

"I personally feel," Cramer says, "and I have always felt that Clovis-First was very debatable." He suggests instead that the first Americans arrived—by way of both the North Pacific and North Atlantic—during or soon after the time of the Farmdalian Recession during the middle Wisconsin stage, about 25,000 years ago. Simply stated, a goal of the five Funds is to determine whether there is evidence of an aboriginal presence in the New World during pre–glacial maximum times.

He is fully aware that this is an ambitious undertaking, pushing the arrival of the first Americans back more than

Postgraduate Field Course

Geomorphology and Quaternary Geology of Tierra del Fuego
March 15–30, 2003

This is a rare opportunity to participate in a rigorous examination of the Quaternary chronology, paleoenvironments, and paleoclimates of varied landforms in the Isla Grande de Tierra del Fuego.

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 collecting data from different sites in Tierra del Fuego relating to mass-movement processes and glacial, periglacial, coastal, fluvial, and eolian landscapes. Augmented by topographic sheets, satellite imagery, and aerial photographs, the data will be analyzed in the laboratory to define the Quaternary chronology of Tierra del Fuego and Patagonia and its relationship with continental and global records. The course will occupy about 200 hours of field work, in addition to lab work of undetermined duration.

Participants

Participants will be selected from university graduates, preferably of recent years, in Geology, Geography, Archaeology, Biology, Ecology, Agricultural Sciences, Forestry, Tourism, and related disciplines. Logistic considerations fix the minimum number at 10, the maximum at 24. Members will be chosen from applicants by the Director and faculty.

A successful applicant will satisfy these requirements: be computer literate; be proficient in Spanish or English (support in Portuguese, Italian, French, and German may be provided upon request); possess a valid passport and, if required, an Argentine visa; be a university graduate in the cited disciplines before 31 December 2002; 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 14–31 March 2003.

Costs

Total cost of the Field Course is $400 (U.S. dollars) per participant, including registration fees, materials, surface transporation 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 December 2002: 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 December 2002 will be considered only if the maximum number of participants have not been enrolled.

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10,000 years before the Clovis culture, the earliest verified human presence in North America. He's also a realist. "This is a difficult search," he admits. "Even if my theory is correct, we may never find preserved evidence."

Cramer is dissatisfied with the theory about migration across the Bering Land Bridge and doubts the existence of an Ice-Free Corridor at the critical time. Unquestionably animals traversed the Land Bridge for thousands of years. But he feels we should start looking for the first *people* at a time well before the Wisconsin glacial maximum. The Farmdalian was a period of significant warming—he notes that it has been called the Altithermal of the Wisconsin—whose effects can be seen all over the New World, particularly in the upper Midwest. "If we can find a cultural presence during that period," he theorizes, "they will have been colonizing from that time until the present." Moreover, if he is correct about the timing of the first human arrivals, they would probably have been boat people, since the Land Bridge was inundated by the rising sea level during the Farmdalian Recession. Once the first immigrants arrived, there needn't have been any discontinuities in human population because, he reasons, "once you're south of the ice, you can adjust your habitat north or south as the climate dictates."

Since Cramer's theory puts the first immigrants in North America thousands of years before the Clovis culture, where does that place Clovis in the peopling of America? He suggests that the Clovis phase may have appeared initially in the East or Southeast and underwent a developmental sequence of early, middle, and late Clovis as migrants moved westward; the latest stage is what we know as the classic Clovis of the Great Plains. Completing the sequence is the so-called Western Clovis of the Great Basin, which has never been dated; when it is, he believes it may prove to be a Western sequential phase of Great Plains lithic technology—a post-classic phase.

EILEEN JOHNSON

DAVID MELTZER

Vance Holliday at the Lubbock Lake site on the High Plains of Texas: (*right*) preparing to cut core samples from Paleoamerican strata, using a Giddings soil coring rig; (*above*) explaining the site stratigraphy on a geological field trip, c. 1980.

Needed: a special breed of scientist

The Executive Directors of the Archaeological Research Funds are chosen quite carefully, and for a good reason. The success or failure of this ambitious program depends on observing a basic premise that's obvious but worth stating anyway:

> If you're looking for evidence of man 25,000 years ago, you must study 25,000-year-old sediments, those that date to well before the glacial maximum.

The first step in the discovery process, therefore, is to find and date buried soils and sediments that are potential repositories of ancient human remains. This means that work in the initial phase calls for a geologist specifically educated in sedimentology and geomorphology and with experience as an archaeologist. Geoarchaeologists are scientists who embody this marriage of disciplines, and the Executive Directors are chosen from their ranks. No university in the U.S. confers a doctorate in geoarchaeology (although Cramer hopes this will someday change); its practitioners develop their skills by doing. The Executive Directors fall into two groups, those who approach geoarchaeology with solid geologic knowledge, and those whose education and experience are in anthropology. In the first group are Holliday, Mandel, and Waters; in the second are Goebel and Meltzer.

Dr. Holliday (Argonaut), who received his doctorate in geology, boasts one award from the Geological Society of America in Quaternary geology and geomorphology, another in archaeological geology (he is author of a volume on Paleoindian geoarchaeology of the Southern High Plains). Like the other Directors, Holliday realizes the Funds require the skills of specialists in varied disciplines. "All of us," he concedes, "are or will be using part of the funds to bring in and collaborate with other investigators. No one individual inside or outside of the five programs can do it all. Paleoindian research historically is interdisciplinary, and geoarchaeology by its very nature is an interdisciplinary endeavor." Holliday has worked alongside Meltzer in the field, and next summer he plans to collaborate with University of New Mexico archaeologist Bruce Huckell on Paleoindian sites in the Albuquerque Basin. According to Holliday, the key to success of the Funds is shared work and the assistance when needed of specialists like paleobotanists, geochronologists, and paleontologists.

Although Dr. Mandel (Odyssey) was educated in soils geomorphology, he allows that "I could call myself a geoarchaeologist because that's what I've been doing for the last 20 years." During that period he has applied his knowledge of soils, landscape evolution, and Quaternary stratigraphy to archaeology. Along the way he has found time to serve as editor-in-chief of

Geoarchaeology: An International Journal for the last four years. He explains that "in simple terms, what I've been doing is looking at temporal and spatial patterns of landscape evolution over the last 20,000 years"; his technique is by "systematically working through drainage basins and seeing what's preserved in those basins in geologic deposits." It's no surprise that Cramer believes that Mandel may turn out to be the best qualified of all applicants for the position of Executive Director of Odyssey.

Trained as a geoscientist with extensive archaeological experience, Dr. Waters (North Star) has earned a reputation in geoarchaeology. His book, *Principles of Geoarchaeology*, is used as a text in many universities across the U.S. and in Canada and Europe. He explains that a geoarchaeologist can work, for instance, in a river drainage and determine the location of "old ground" deposits if the terrain is undisturbed. "It's applied geology," he says. "We just happen to be applying our geologic skills to archaeological problems."

At the opposite end of the spectrum is Dr. Meltzer (Quest), schooled as an anthropologist, who has nonetheless developed great skill at interpreting buried landscapes over nearly 20 years of exploring Paleoamerican sites, including Folsom sites in New Mexico and Clovis sites in Texas—and who has called on Holliday for help to crack a particularly tough geologic nut.

Dr. Goebel (Sundance) has been practicing Paleoamerican and paleolithic field archaeology since he was a beginning graduate student. His specialty is lithics and stone tools, but he is quick to state, "I've excavated numerous archaeological sites shoulder-to-shoulder with geoarchaeologists and paleoecologists, and have learned a fair amount from them."

A mixed bag of regions

Pick any Archaeological Research Fund. Within the geographical area circumscribed by its region, you can name sites where evidence of early Americans has been found. For Sundance, there's Danger Cave and Spirit Cave; for Argonaut, Murray Springs and other mammoth-kill sites in the San Pedro River drainage; for Quest, Folsom, Blackwater Draw, and Midland; for North Star, Topper and Cactus Hill; for Odyssey, Lindenmeier, Dent, and Big Eddy. But Cramer has set the colonization threshold at a time that predates, by thousands of years, the earliest evidence of Paleoamericans ever found. Faced with this heady challenge, each Executive Director has to deal with a different set of problems and opportunities.

In the case of Sundance and Argonaut, in the desert West and Southwest, the problem is erosion by wind and water. "We're looking for old dirt," says Goebel, but lack of vegetation led to rapid erosion. "After the Paleoamerican period, it became incredibly dry here; ancient deposits were washed or blown out, leaving early sites exposed upon the surface of the ground or redeposited under many meters of sediment." For both Holliday and Goebel, playas are an important avenue of research. Holliday plans to investigate the potential Paleoamerican record of the dry lake basins of the Southwest, which first drew his interest as a graduate student. He reasons that paleolakes in the region must have attracted early occupants, especially if people were here 15,000–25,000 years ago, when the lakes were even larger than during Clovis time. For Holliday, the lake records hold promise of resolving questions about the peopling of the New World. Even more ambitious are his plans to target northern Mexico. What he calls "tantalizing hints" from scattered publications and from discussions with Mexican archaeologists suggest that the region may hold a spectacular Paleoindian record. So far there have been no systematic attempts to uncover this record. That's about to change. He foresees for Argonaut a joint research program with U.S. and Mexican archaeologists, concentrating on Sonora and Chihuahua.

Goebel, whose region is also rich with playas, is currently focusing his research on caves and rockshelters. The Bonneville Estates Rockshelter near Wendover, Nevada, has yielded evidence of a basal occupation dated by charcoal from a hearth to 10,100 RCYBP (about 11,900 CALYBP)—and underlying that occupation is sedimentation more than a meter thick! Goebel is understandably excited because the rockshelter contains diagnostic artifacts and faunal remains unmistakably associated with a dated archaeological feature, the hearth.

Clovis and Folsom, the most famous Paleoamerican sites in the U.S., sit in Meltzer's backyard. Clovis has become the standard against which evidence of early Americans is compared, with the hope of predating the standard. Over the past 40 years, when purported pre-Clovis sites were found, Meltzer notes they

"failed to pass muster for lack of good artifacts and well-dated geological contexts. The necessary strategy for solving the puzzle is finding solid geological evidence and surveying and testing ancient land surfaces to detect the traces of these early people." Folsom, on the other hand, is a neglected resource. Original excavations begun in the 1920s were occupied with studying the association of human artifacts with Pleistocene bison skeletons. This was exciting work at the time, but further study of Folsom sites was largely forgone, principally because of the narrow scope and crude scientific techniques of the pioneer study. Quest has given Meltzer the resources to revisit the original Folsom site in New Mexico and apply up-to-date methods to examining its geology, stratigraphic history, and geochronology. Radiocarbon dating, for instance, an invaluable tool of archaeologists that wasn't available until the 1950s, puts the age of the Folsom bison kill at 10,500 RCYBP (about 12,300 CALYBP). This is news that would certainly flabbergast the original researchers. Meltzer assures us we haven't heard the last of Folsom.

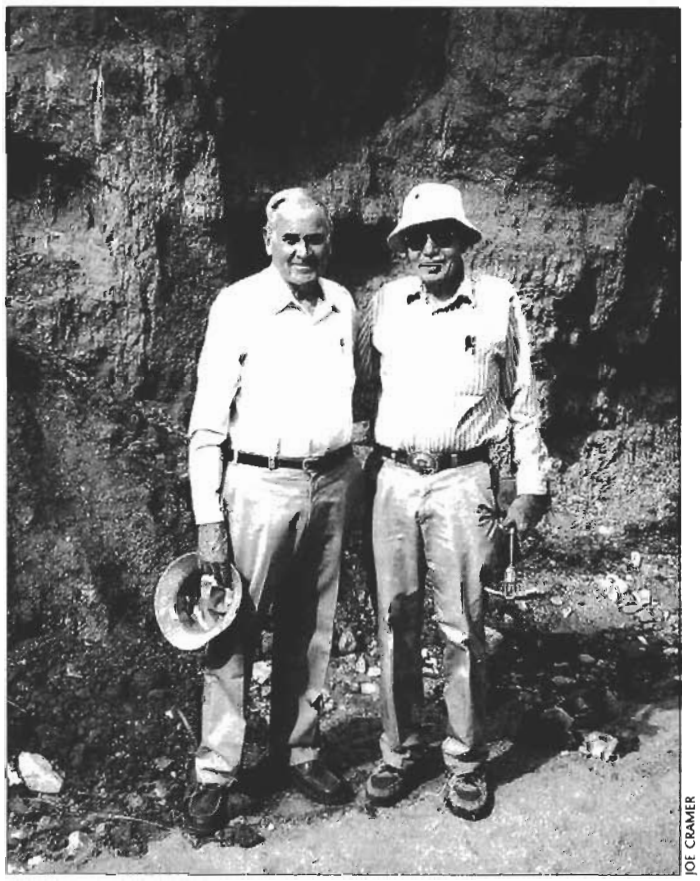
Mandel is, to use his own words, "ahead of the curve" when it comes to locating deposits that date back to Paleoamerican times and earlier. It's exactly the kind of work he's been doing for the past decade under a grant funded by the U.S. Department of Transportation (DOT) and administered by the Kansas Historical Society. The study falls in the category of cultural resource management; as part of long-range planning for highway construction, DOT is required, by act of Congress, to perform a survey in order to avoid endangering archaeological deposits. (Last year we reported on Rick Will of Ellsworth, Maine (**MT** 16-3, "A Professional Archaeologist"), who performed a similar survey for an engineering firm that laid a natural-gas pipeline across the entire length of Maine.) Consequently, Mandel has already examined all the drainage basins in Kansas and as a result has amassed nearly a thousand radiocarbon-dated samples, which he admits is "a pretty good dataset." In terms of locating material of the age that Cramer seeks, Mandel says matter-of-factly, "I've already got a pretty good picture of where, if it's there, it's going to be." Thus he has a head start in Kansas and southern Nebraska, and he has also done work in the Black Hills of South Dakota, an area of special interest to Cramer.

North Star, which was co-funded by **CSFA,** is unique among the Funds because, by design, no specific region of interest has been designated. Years ago Cramer developed the view that the paleoenvironment of the East was greatly misunderstood and misinterpreted. Most of the research was done early in the 20th century before modern radiometric techniques were available; what's more, early researchers were narrowly focused and failed to appreciate the geologic importance of evaluating sedimentation. Cramer and Mike Waters agree that a fresh start is required. Consequently, instead of concentrating on any local area, Waters is assessing the whole East and Southeast, basically all the country east of the Mississippi and south of the Laurentide Ice Sheet. His playing field is immense in proportions—and rich in possibilities.

Endowments of a special kind

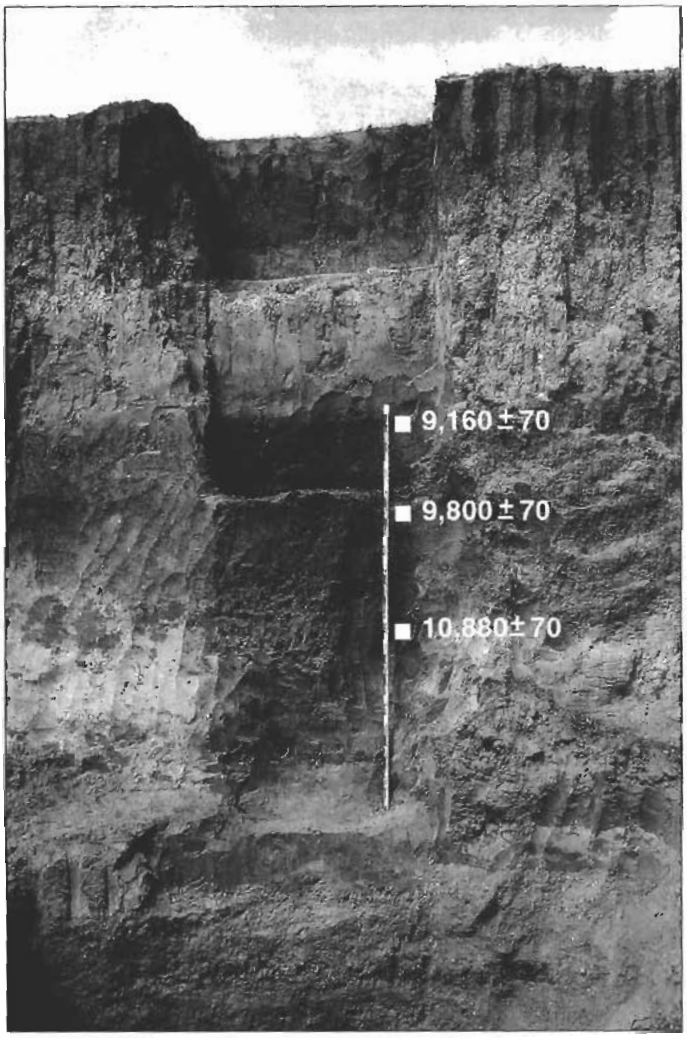
Joe and Ruth Cramer are paying for the Archaeological Research Funds mainly with after-tax dollars—in other words, out of capital. The Cramers aren't the typical donors that universities are used to dealing with. Cramer says frankly, "I'm sure that for the first time in every case they aren't dealing with someone who's looking for a tax write-off."

Nevertheless, the Cramers demand their money's worth. They insist that the university foundation for each Fund handle the money at no charge; the cost of administering the Fund is the university's donation. Moreover, Cramer makes it clear that he and Ruth are paying for research, not for overhead. The salary for the Executive Director—who must be a teaching professor—is paid by the university for the full school year; the university thus pays for the required three months of extra contract, the time spent actively engaged in field work. Research expenses are paid for by earnings from the endowment, which must be guaranteed by the university foundation to yield a minimum return of 6 percent. The terms the Cramers attach to their Funds are so uncompromising that at least one university turned them down. The five universities that accepted their terms, however, now have in place far-reaching programs that are certain to enrich studies of the peopling of the Americas for generations to come.



JOE CRAMER

Joe Cramer (*left*) with C. Vance Haynes, Jr. at the Murray Springs Clovis site, Cochise County, Arizona, July 2000. Dr. Haynes, professor emeritus of Anthropology at University of Arizona, probably deserves more credit than any other man for applying sedimentology and geomorphology to archaeological field research—in other words, practicing geoarchaeology, which Cramer believes "is indeed the new, new archaeology."



David Meltzer welcomes Quest as relief from the treadmill of applying for research grants, such as those from the National Science Foundation (which usually have the additional drawbacks of being narrowly targeted and demanding short-term results). "There's lots involved in the research process," Meltzer notes. "Not having to worry about the funding is one major component that makes research easier and more efficient." For Rolfe Mandel, Odyssey is the opportunity to do a long-term, systematic study, made possible because of the nature of the donors themselves. Now, says Mandel, "Cramer wants people to go out with an open mind and explore, *really* explore."

Joe and Ruth Cramer's archaeological funds are a significant contribution to our study of Paleoamericans. **CSFA** Director Rob Bonnichsen acknowledges that "the field of first American studies is deeply indebted to the generosity of Joe and Ruth Cramer." Mike Waters goes on to add, "We need to acknowledge the magnitude of their gift to science. The knowledge that has been generated so far, and the research results yet to come, will transform our knowledge of the First Americans forever."

Below, the long cutbank at the Claussen site along Mill Creek in northeastern Kansas discovered by Rolfe Mandel in 2001. There are three cultural horizons in the lower part of the section (arrow). The uppermost cultural horizon, about 9 m (29½ ft) below surface, dates to about 9000 RCYBP. Dating the cultural horizons below it will be the focus of an excavation in summer 2003, with the support of Cramer's endowment of the Odyssey Archaeological Research Fund. Left, a cutbank at the Powell site in northwestern Kansas, 2001. (The rod is 2 m long, about 6½ ft.) Says Mandel, "This is a very good example of one of the many cutbanks that I have examined in the draws on the High Plains of western Kansas. A Clovis point and camel bone were found at the Powell locality."

BOTH: ROLFE MANDEL

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$3 Million and Counting!

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Summary of Costs

The Kennewick Man lawsuit (*Bonnichsen et al. v. U.S.*, Civil No. 96-1481 JE, District of Oregon) has resulted in the release of many documents concerning federal agency activities relating to the skeleton, its discovery site and the lawsuit. Among them are documents disclosing various amounts paid by the U.S. Army Corps of Engineers (the "Army Corps") and the Department of the Interior ("DOI") for their Kennewick Man activities. Although these documents are far from complete, they do provide some sense of the magnitude of federal expenditures for this controversial affair. The following table summarizes those expenditures for which amounts can be calculated or otherwise estimated.

Minimum known costs	
Survey of discovery site	$163,000
Burial of discovery site	166,750
Staff support (National Park Service only)	260,000
Storage costs	263,291
Skeletal studies	50,318
Affiliation studies	64,106
Employee travel costs	105,700
Conservators' travel costs	16,620
Miscellaneous costs	10,607
Subtotal	$1,100,392
Other estimated costs	
Time devoted by professional and policy personnel	$1,000,000
Staff support (other agencies)	520,000
Conservators' fees	49,500
Subtotal	$2,669,892

Items referred to in the table as "minimum known costs" represent those expenditures for which there is sufficient documentation to verify or calculate totals likely to be reasonably accurate (at least as to minimum amounts). Items referred to as "estimated costs" represent those expenditures for which only generalized (or "ballpark") estimates are possible. . . .[Report provides details of how costs were calculated.]

Total government expenditures for the Kennewick Man affair are likely to be higher than the amounts calculated here. Among other things, the amounts calculated here include only the costs incurred by the Army Corps, DOI, and to a lesser extent the Department of Justice. Other federal agencies (including the White House) are known to have participated in the affair, and they would have had related (but unknown) costs. In addition, the documents released by the Army Corps and DOI cover only the period from discovery of the skeleton to September 2000, and even then are likely to understate actual costs for that period of time.

Federal expenditures for the Kennewick Man affair did not end in September 2000. Costs have continued to mount (and are still continuing) for storage of the skeleton at the Burke Museum, for conservators' fees and expenses, and for time and travel by government personnel. Both the Tribal Coalition and the government have appealed the District Court's decision. Substantial costs could be incurred for these appeals, and the government could be required to pay the fees and costs of the plaintiffs' attorneys. Such items could increase the final expense total for the Kennewick Man affair by another million dollars or two. . . .

What Did the Government Achieve?

Despite all the time and money invested by the federal government in the Kennewick Man affair, little has been accomplished other than to provide an expensive example of poor decision-making. The original decision of the Army Corps to give the skeleton to local tribes was vacated by the District Court in June 1997 (*Bonnichsen et al. v. U.S.* 1997). Forty-two months and millions of dollars later, the Army Corps and DOI decided once again to give the skeleton to the same group of tribes. **That decision too has been overturned by the court. . . .**

From a scientific perspective, some useful information has been gained. WES' investigation of the discovery site has established the general contours of the site's geology. . . . However, many questions concerning the site remain unanswered. . . . It is not known whether Kennewick Man was buried at the site by other humans or as a result of natural causes such as a flood. . . . Since no excavations were made, it is not known whether the site contains other human remains or intact archaeological deposits. These questions and others that might arise in the future may

Judge Rules on Kennewick Man

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court record and implies his decision was influenced by ulterior motives:

> The Jelderks have been in Oregon for more than a century on land that used to belong to Native Peoples. . . . He was a country lawyer and a fledgling judge at a time when Oregon and Washington were fighting most ferociously to keep Indians from fishing on the Columbia and throughout the Pacific Northwest.

Such criticisms of Jelderks are unwarranted and amount to little more than spiteful innuendo. The fact that he took 14 months to review the evidence is a reflection of his thoughtful deliberation and thoroughness.

Response of the Department of the Interior

The Department of the Interior has, so far, issued no public statement regarding Jelderks's decision. It has appealed the ruling, however.

And so the bizarre odyssey of Kennewick Man continues. Jelderks's ruling is a clear victory for science and a setback for those who seek to use NAGPRA to end all study of ancient human remains in the United States. The force and thoroughness of Jelderks's decision make it unlikely that it will be overturned on appeal. The Confederated Tribes of the Umatilla Indian Reservation, and the other Native American tribes involved, are, however, passionately committed to protecting what they regard as the graves of their ancestors. They have expressed their intention to appeal the decision all the way to the U.S. Supreme Court if need be. They fear that this decision subverts NAGPRA and gives "complete control

never be answered because of the havoc caused by the Army Corps' burial of the site.

The DNA tests ordered by NPS were negative. No DNA was recovered. . . . However, the bone samples used for these tests may not have been the most suitable. It is possible that DNA might still be obtained from the skeleton if denser cortical bone or a tooth were tested. . . . Chemical testing of bone can help to determine whether it is suitable for DNA investigation. . . .

There are also lingering questions about the radiocarbon dating tests conducted for NPS. Three of the bone samples tested were so deficient in collagen that it was impossible to date them. . . .

The results of these radiocarbon dating and DNA tests are meager when measured in terms of the amount of damage inflicted on the skeleton. The bone samples extracted for these tests totaled approximately 50 grams. . . . In the process, one metacarpal and one metatarsal were destroyed, and a three inch long segment was taken from the one remaining complete tibia. By way of contrast, earlier in the case the Bonnichsen plaintiffs asked for a total of four grams of bone to use for radiocarbon dating, DNA testing and stable isotope analysis. . . . Government attorneys rejected this request as being "excessive" and "unnecessarily destructive". . . . The segment cut from the tibia for NPS' studies destroyed an important landmark used for taking measurements. . . .

The government has taken more than 1500 photographs of the skeleton. . . . Most are worthless from a scientific perspective because of poor lighting, improper positioning and other defects. . . . The x-rays taken for NPS also have little value. . . . Unnecessary x-raying of archaeological bone should be avoided since it can damage any residual DNA in the bone. . . .

Conclusion

The total amount spent by the federal government on the Kennewick Man affair may never be known. Minimum known costs are approximately $1,100,000. Other costs are probably not less than $1,500,000 and may exceed $2,000,000. These amounts are not even the final cost bill. Government expenditures on the skeleton and the lawsuit continue to mount, and there is no end in sight.

One perplexing question is why federal officials chose to make such a massive investment of time and money in this affair. Was it because of a perceived need to reunite Kennewick Man's remains with his present-day descendants? Such an explanation is difficult to reconcile with the known facts. The Army Corps made its decision to give the skeleton to the tribes without any credible evidence to establish that they had a valid claim under NAGPRA. . . .

Two weeks before the Army Corps publicly announced its plans for transfer of the skeleton, a memorandum prepared at its Portland, Oregon regional headquarters warned that tribes "can be expected to dutifully pursue" all human remains found in their ancestral territories "even if they cannot trace direct kinship to the find itself" (Army Corps 1996). The memorandum also warned that "from a strictly scientific standpoint, the fact is that we do not really know how very ancient human remains might be related to contemporary Indian peoples." These warnings were ignored even though tribal claimants conceded that affiliation with the skeleton was impossible to prove because of its age (CTUIR 1996). Kennewick Man's relationship, if any, to present-day American Indians was then (and still is) unknown.

Equally perplexing is the government's adamant opposition to any study of the skeleton by the Bonnichsen plaintiffs or other independent scientists. DOI representatives testified before Congress that NAGPRA does not prohibit study of ancient skeletal remains found on federal land (Stevenson 1998). Similarly, DOJ attorneys conceded in court that NAGPRA is silent on the question of study. . . .

In the final analysis, the government's handling of the Kennewick Man affair may have had as much to do with miscalculation and private agendas as with anything else. . . . Secretary of the Interior Bruce Babbitt reportedly told a meeting of the National Congress of American Indians that his "partnership" with the tribes was the "most transcendent" experience of his life (AP 2000). This comment came just a few months after his decision in the Kennewick Man case.

The federal agencies involved in the Kennewick Man affair were so committed to satisfying tribal expectations that they were prepared to defy Congress. When a Congressional aide asked the Army Corps not to bury the skeleton's discovery site without prior Congressional review, the Army Corps refused. It viewed the request as "a precedent we don't want to set" and "one of those 'don't blink' issues". . . . It did not blink. As soon as Congress recessed for Easter, the discovery site was buried. The Army Corps took this action despite the fact that both houses of Congress had just approved legislation to prohibit implementation of the burial project. . . .

After six years and costs of $3,000,000 (or more), the ultimate fate of Kennewick Man's skeleton has yet to be resolved. A final resolution may still be years and more millions of dollars away. It can only be hoped that something will be learned from the process so other controversies of this kind can be avoided.

over Native American ancestral human remains to scientists."

The Society for American Archaeology, in a press release responding to Jelderks's decision, asserts that it

> does nothing to undermine NAGPRA's objectives as they were intended by Congress. However, as the first judicial review of key legal issues, it provides an urgently needed corrective to the expansive interpolations of the Act that have been too often employed by federal agencies and museums.

NAGPRA was intended to effect a compromise between the rights of Native Americans to protect the graves of their ancestors and the equally legitimate rights of scientists to contribute to our understanding of the ancient world by studying human remains such as Kennewick Man. Secretary Babbit, and like-minded federal bureaucrats, were the ones who attempted to subvert the NAGPRA compromise by illegally deciding to surrender the bones of Kennewick Man to a coalition of tribes, none of whom were demonstrably related to this Ancient One. Jelderks's decision restores the balance that Congress originally intended for NAGPRA and recognizes the rights of scientists to listen to Kennewick Man's "voice made of bone."

The full text of Jelderks's decision can be found on the Friends of America's Past Web site **www.friendsofpast.org/** (where future updates on the appeals process will also be posted). Other useful sources of information are the *Tri-City Herald* Kennewick Man Virtual Interpretive Center at **www.kennewick-man.com/** and the National Park Service Kennewick Man pages **www.cr.nps.gov/aad/kennewick/index.htm.** One of the best sources of background information on the Kennewick Man story is Jim Chatters's book *Ancient Encounters: Kennewick Man and the First Americans* (New York: Simon and Schuster, 2001).

Mammoth Rocks

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The Importance of Ancient Rubbing Rocks

The Sonoma Coast rubbing rocks appear to document the rubbing behavior of late-Pleistocene Rancholabrean herbivores, especially the Columbian mammoth and ancient bison. Domestic horses, cows, and sheep probably created a lower grouping of fresher-appearing rubs during the historic period. Provided that a Rancholabrean origin can be attributed to the rubbing rocks, they are important for several reasons.

First, the rocks are points on a map for identifying the former presence of megaherbivores and their seasonal migration patterns.

Second, Rancholabrean-era rubbing rocks may suggest a concentration of megaherbivores, and consequently an area of focus for Paleoamerican hunting activity.

Finally, ancient rubbing rocks may prove to be untapped sources of aDNA, both in the ground and within the microtopography of the rock surfaces. Future efforts at recovering fossil hair from the soils around the rocks, and aDNA from within the rocks, may prove to be the most important aspects of any future investigation.

The Mammoth Rocks site appears to be unique, but it shouldn't be. Similar sites should be found wherever there is a late-Pleistocene history of megaherbivores, especially proboscideans and bison. If I'm correct, there should be additional sites awaiting discovery throughout North America and in Europe, Asia, and Africa. I'd love to hear from anyone who knows of any other occurrences.

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Suggested Readings

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About the author E. Breck Parkman is a Senior State Archaeologist with California State Parks. He has worked throughout California, on Kodiak Island, in Alaska, the Canadian Plains, the south coast of Peru, and central Siberia. He has published more than 50 scientific articles in American and foreign journals. He earned B.A. and M.A. degrees in Anthropology from California State University, Hayward. He is the Director of the UNESCO-sponsored Fort Ross–Global Village Project, an Internet-based educational project bringing Russian and American students together in the study of archaeology and history. He also serves as a Research Associate at the University of California, Berkeley, and is a past president of the Society for California Archaeology. He is a recipient of the Society's Mark R. Harrington Award for Conservation Archaeology. In 1998 he was presented the prestigious Hammer Award by Vice President Al Gore for his efforts at helping to reinvent government.


E. BRECK PARKMAN